The Fluctuations of Mentalisation and Epistemic Trust Throughout the Day: A Study Using the Experience Sampling Method

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Abstract

Research on mentalisation and epistemic trust has mainly focused on cross-sectional studies investigating the relation of trait-like mentalisation and epistemic trust to psychopathology. This study investigates the daily fluctuations of mentalisation and epistemic trust using Experience Sampling Methods (ESM). It was hypothesised that (1) mentalisation and epistemic trust fluctuate throughout the day and (2) epistemic trust and mentalisation levels depend on social context and current activities. Participants (N = 21, mean age = 23 years, 66.67% female) filled out ESM items six times a day for 14 days. In total, 1504 time points were analysed using linear mixed-effects models. There were minimal, significant effects for time of the day on both mentalisation and epistemic trust. Mentalisation increased towards the end of the day while epistemic trust decreased. It was found that mentalisation positively correlated with being with acquaintances compared to being alone and engaging in relaxing activities compared to stressful ones. Epistemic trust was significantly higher when with acquaintances and significantly lower when the participant was with strangers. Epistemic trust was significantly lower during relaxing activities. This study was the first that applied ESM to determine which factors influence mentalisation and epistemic trust throughout the day. The results raise the question of whether mentalisation and epistemic trust are both trait- and state-like psychological concepts. It is also not known why the association between epistemic trust and relaxation is negative. Both questions should be taken into account in future research.

The Fluctuations of Mentalisation and Epistemic Trust Throughout the Day: A Study Using Experience Sampling Method

Mental health is an integral part of human life. Indeed, it is so important that the World Health Organisation (WHO) has declared it a human right (WHO, 2022). The two concepts of mentalisation and epistemic trust have recently gained more attention (Campbell et al., 2021) as they may significantly contribute to mental health (Ballespí et al., 2021).

Mentalisation is an umbrella concept that summarises related theories such as Theory of Mind, social cognition, and emotional intelligence (Luyten et al., 2020; Ballespí et al., 2021; Locati et al., 2023). It is defined as "consciousness about one's own mental states (emotions, intentions, desires, and thoughts) and those of others" (Ballespí et al., 2021, p. 2). It can be automatic or controlled, cognitive or affective, internally or externally focused, and referring to one's own or another person's mental states (Luyten et al., 2020; Ballespí et al., 2021; Locati et al., 2023).

Two aspects of mentalisation have been explicitly related to mental health: self- and other-mentalisation (Locati et al., 2023; Müller et al., 2023). Self-mentalisation entails the awareness of what one is feeling, which promotes self-regulation and can help one cope with their emotions (Ballespí et al., 2021; Locati et al., 2023). Ballespí et al. (2021) argue that people have different levels of clarity about their inner states: Self-mentalisation "can be operationalized either as simple attention to one's own emotions (that is, the degree to which individuals notice their feelings) or as further comprehension or emotional clarity (that is, the ability to distinguish and to understand one's mood)" (p. 3). On the other hand, understanding mental states of others, i.e. other-mentalisation, is fundamental to navigate through one's complex social world (Luyten et al., 2020). It helps one handle their daily lives by understanding other people's actions (Ballespí et al., 2021), allows them to adapt to complex environments, and helps them comprehend and predict the behaviour and mental states of others (Müller et al., 2023). This can lead to social interactions of higher quality, fewer interpersonal conflicts, and is related to social and role functioning (Luyten et al., 2020; Ballespí et al., 2021). The ability to mentalise develops in children (Luyten et al., 2020) and becomes increasingly complex with age (Ballespí et al., 2021) and sociocultural factors such as peers can play a role in its development (Luyten et al., 2020).

Epistemic trust is related to mentalisation and includes "evaluating social communication, incoming information from the social world, as accurate, reliable, and relevant" (Locati et al., 2023, p.1565). Well-balanced epistemic trust enables individuals to remain open to social learning and be resilient when facing challenges (Campbell et al., 2021;

Locati et al., 2023). Humans assess the competence, intentions, and honesty of others before accepting the information communicated to them, in order to protect themselves from unreliable informants and information (Sperber et al., 2010; Campbell et al., 2021). This process is called epistemic vigilance and is used to identify and protect oneself from misleading or false information conveyed by others.

Children are born with epistemic vigilance and overcome this state to optimally develop epistemic trust during childhood (Luyten et al., 2020). In fact, even infants and young children show epistemic vigilance (Sperber et al., 2010; Locati et al., 2023). In early relationships, humans learn to distinguish who is knowledgeable and trustworthy. Next to the parents, other social influences such as peers and people from one's community, and social media may facilitate or hinder the development of epistemic trust (Luyten et al., 2020).

Interestingly, epistemic trust and mentalisation influence each other (Luyten et al., 2020; Locati et al., 2023). For example, mentalising helps individuals discern the intentions of other people and identify them as trustworthy or ingenuine (Sperber et al., 2010; Luyten et al., 2020). If one is unable to correctly interpret someone else's intentions, they may trust an unreliable source or distrust a reliable one (Fonagy et al., 2015). Additionally, when communicating information to someone else, it is advantageous to consider their perspective and see whether they are vigilant or distrustful (Sperber et al., 2010).

To find out how mentalisation and epistemic trust work, it is crucial to determine which factors contribute to increased or decreased levels of those concepts. Nevertheless, a lot of research on mentalisation and epistemic trust has focused on clinical samples instead of a general population. This is a serious research gap as Ballespí et al. (2021) found no relation between symptoms and mentalisation. Moreover, both mentalisation and epistemic trust have mostly been regarded as stable traits instead of state-like constructs, despite some researchers arguing that e.g., mentalisation is state- and context-dependent (Luyten et al., 2020). Additionally, it is plausible that a person's degree of epistemic trust depends on who they are interacting with. For example, people generally trust their friends and family more than they would trust strangers. Due to the lack of research, it is not yet known which role mentalisation and epistemic trust play in daily (social) functioning.

Assessing how mentalisation and epistemic trust change throughout the day may help understand the processes underlying everyday life. For example, when making a decision one needs to critically assess the information they have been given and think about how other people could profit from and feel about it. For psychotherapy, the client needs to trust the therapist to learn new ways of thinking and behaving, for example. If these concepts change

throughout the day or depending on stress and company, it may be valuable to know when this happens. For instance, stressful activities may cause a person to become more critical of the information they receive from others. Additionally, Luyten et al. (2020) argue that e.g., mentalising capabilities become more automatic and less-refined during stress. Nevertheless, no study has yet researched the momentary fluctuations of these concepts. Due to this research gap, several researchers have pointed out the necessity for measuring mentalisation longitudinally (Luyten et al., 2020; Müller et al., 2023) to examine the which factors impact mentalising at different times and in different contexts.

Additionally, Myin-Germeys et al. (2018) have argued for studying mental health and related concepts in a real-life environment, e.g. using experience sampling methods (ESM). This method is designed to intensively measure the participants' thoughts and feelings in near real-time (Myin-Germeys et al., 2018; Turner, 2020) and can help assess a participant's experiences in real or near-real time. This has the advantage that the results of the questionnaire are not subject to retrospective bias (Larson & Csíkszentmihályi, 2014).

Study Goals

As most of the research on mentalisation and epistemic trust focuses on cross-sectional and correlational analysis of trait-like operationalisations in clinical populations, it remains to be investigated whether mentalisation and epistemic trust fluctuate throughout the day within an individual in a non-clinical sample and which situational factors may influence these potential fluctuations. Using ESM to assess the current state of the participants, this thesis will answer the question: How do mentalisation and epistemic trust fluctuate throughout the day?

Hypothesis 1

Firstly, it is hypothesised that mentalisation and epistemic trust will vary throughout the day. It is likely that individuals show certain trends in their scores, e.g. generally score low on epistemic trust, but that there are significant fluctuations in their scores based on time of the day.

Hypothesis 2

Additionally, it is hypothesised that momentary activities and social context affect mentalisation and epistemic trust. Acute stressors (physically or mentally) may decrease mentalising capacities and epistemic trust. Therefore, scores of mentalisation can be expected to be decreased when a person is experiencing acute stress (Luyten et al., 2020). Additionally, it is hypothesised that people are less epistemically vigilant when they are with their friends and family than when they are with strangers.

Methods

Study design

The present study was a longitudinal study using ESM data to investigate the fluctuations of mentalisation and epistemic trust over a 14-day period in a non-clinical sample of young adults, as well as the potential role social surroundings and current activities may play. It was approved by the Ethics Committee of Humanities and Social Sciences of the University of Twente on 26 February 2024 (study request number 240111). Data were collected from March to May of 2024. This paper follows the STROBE guidelines for reporting observational studies (von Elm et al., 2008). The data collection was done collaboratively with two other psychology students working on their Bachelor's thesis at the University of Twente.

Setting

Data collection took place online from 28 March until 9 May 2024. From 28 March to 25 April, participants could sign up via SONA Systems (www.sona-systems.com), a website used by the faculty of Behavioural, Management and Social Sciences (BMS) of the University of Twente, where students can earn credits for research participation. After signing up, participants were contacted by the researchers to schedule an intake interview. This could take place either in-person or online. Its purpose was to (1) increase the participants' motivation for the study, (2) explain the study procedure, (3) answer questions about the study, and (4) explain and obtain the informed consent (Appendix A). During the intake meeting, participants were asked about their daily schedules (e.g., wake-up and sleep hours) to tailor the time slots for the six daily measurements to them. This way, prompts were only sent when participants were awake to maximise compliance with the ESM reporting. After the meeting, the respondents filled in the first part of the survey, consisting of demographic questions and a personality questionnaire (the latter was used for another project, but was not part of this analysis).

Participants

Participants had to be between 18 and 35 years of age. They needed a device on which they could download the m-Path app on their IOS or Android smartphone. Moreover, they needed to possess a basic English level. Participants were recruited either via SONA or direct approaches, where the researchers sent study links to WhatsApp groups of fellow university students and encouraged friends and acquaintances to participate. They received 3.25 credits on SONA for their successful participation. Further, participants were required to consent to an intake interview with one of the researchers. Additionally, participants were informed

during the conversation that they were eligible to win a 50€ Amazon.com voucher by completing more than 80% of the prompts.

Experience Sampling Method

ESM was used to gain more insight into the momentary levels of mentalisation and epistemic trust, as well as their current activities and social company of the participants. In this method, participants are asked to report their experiences throughout the day (Turner, 2020). This sampling method was developed to gain insight into the activities, feelings, thoughts, and overall experiences of people during their daily lives. ESM allows for the identification of differences in experience in day-to-day life, rather than simply measuring stable traits (Larson & Csíkszentmihályi, 2014). Another advantage is the close to real-time data ESM provides (Turner, 2020). To be able to measure fluctuations effectively, frequent measurements have to be taken, which the diary-like nature of ESM allows for. Additionally, the current mental states (i.e., mentalisation and epistemic trust), as well as external circumstances (e.g., social company and current activities), can be accounted for in the data analysis using ESM data (Turner, 2020).

Variables and Measurement

The demographics were collected once after the intake survey. To measure the fluctuation of the concepts, the m-Path (m-path.io) application was used. M-Path is an app developed by the Catholic University of Leuven and originally designed to monitor psychotherapy and interventions in real-time. Participants received six prompts per day via the m-Path app. The prompts were sent randomly within six 2-hour time intervals throughout the day, and participants had 30 minutes to respond to each prompt. Participants were asked to make sure to enable notifications for the m-path app so they could receive notifications for the prompts.

The daily ESM questionnaire consisted of three chosen items per construct (mentalisation, epistemic trust, and well-being, with the latter not used in this research), coming mainly from existing scales and questions about the respondents' current experiences. A short questionnaire with 11 items was created to avoid burdening participants with filling in lengthy questionnaires multiple times a day. The items were adjusted to fit the momentary nature of an ESM study by adding phrases such as "right now" to signal participants to add their current experience. All items were measured on a 7-point scale ranging from 1 (*not at all*) over 4 (*neutral*) to 7 (*very much*). The items were based on their translatability to ESM to make sure that participants in different situations occurring throughout the day could fill them in (see below). For a complete list of the items see Appendix B.

As existing mentalisation questionnaires are developed to measure mentalisation as a trait-like concept, they had to be adjusted to fit the ESM. Three items which could be translated smoothly into ESM items were taken from the Certainty About Mental States Questionnaire (Müller et al., 2023). The items were chosen because they are applicable in various situations throughout the day, e.g. independent of the company of others and using a wording that is widely applicable (i.e., not specific to certain situations). An example item adjusted to fit the ESM is "I understand my feelings right now". This item can be answered in various daily situations and independently of whether someone is alone or with others.

Similar to mentalisation, all established epistemic trust measures treat epistemic trust as trait-like. However, the items of existing epistemic trust scales could not be converted to fit ESM. Therefore, the researchers developed their own items, compared them, and decided on the best-fitting items in consultation with their supervisor. Again, the items were created to be applicable to a wide range of situations throughout the day. Example items are "I currently feel open to absorbing new information" and "I don't feel like learning new things from others right now" (Appendix B). As humans are constantly confronted with new information, these items are also widely applicable.

Finally, participants were asked about their current experiences, i.e. "What are you doing right now?" and "Who are you with right now?". For the former, one could choose between various activities, such as working, studying, or relaxing. For the latter, answer options included "I am alone", "family", or "co-worker/fellow student" and "unknown people/stranger" (Appendix B).

Statistical Analyses

First, it was ensured that every participant filled out both the ESM survey and the demographics questionnaire. When a participant missed a prompt, m-Path recorded no response (i.e., the day and time did not show up in the dataset). However, one participant filled out only the context items sometimes (i.e., social environment and activity), so some data was not recorded. To calculate the mean values of epistemic trust and mentalisation, the averages of the scales were calculated (sum of scores divided by 3).

To answer hypothesis 1, a linear mixed-effects (LME) model was constructed to see whether the associations between time of the day and the dependent variables (mentalisation or epistemic trust) are significant. A LME approach was chosen due to the repeated-measures design and a subsequent violation of the independence assumption. One LME was created per construct, i.e. one for mentalisation and one for epistemic trust. The LMEs included *time of the day* and *participant* as predictor variables. *Time of the day* was used as a continuous

variable that measured the time at which a participant filled in a prompt (e.g., at 11:30 am) and was included as a random slope too as the time of the day affects every individual differently. *Participant* was included as a random intercept to account for the within-subject variance of the model. Additionally, random slopes and intercepts are the gold standard for ESM research to account for the nested structure of the data (Gabriel et al., 2019). Mentalisation and epistemic trust, respectively, were continuous dependent variables. This simple analytical approach is used to make sure there are no other factors despite the time of the day and within-subject variance influencing epistemic trust and mentalisation respectively, and to determine whether the associations between mentalisation (or epistemic trust) and time of the day are significant.

For hypothesis 2, four LMEs in total were created. Two models had *epistemic trust* as a dependent variable. The independent variables were *social company* and *current activity*. Two models had *mentalisation* as a dependent variable. Again, one had *social company* and the other had one *current activity* as an independent variable.

In all four models, a random intercept was added for *participant* to account for the within-person dependence. Initially, both *activity* and *company* each had six levels (see Appendix B). To better visualise the effect sizes, *activity* was dummy-coded into relaxing activities (relaxing and socialising), stressful activities (physical activity, working, and studying), and *other*. Working and studying were included as stressful due to the potential mental stress they may cause. Additionally, depending on the field of work, working may also be physically stressful. It is not known whether people who indicated *other* as an activity during the ESM were engaging in stressful or relaxing activities, which is why had its own category. It should to be noted, however, that these categories are not based on prior research, as there is none available. Thus, the categories are somewhat arbitrary.

For *social company*, a distinction was made between being alone, being with strangers, and being with acquaintances (friends, family, romantic partner, co-worker/fellow student). These categories were based on the assumption that mentalisation and epistemic trust are context-dependent and higher or lower depending on the type of social company a person is in. The categories also do not have a basis in prior research.

The analytical tool used was RStudio (version 4.1.1). To analyse the LME models, the packages lme4 and performance were used. Model performances (e.g., linearity, homogeneity of variance, and normality of residuals) were assessed visually to determine the fit of the linear approach to for the analyses. To prepare the *time of the day* variable, the anytime package was used.

Results

Participants

23 participants were recruited and completed the study. Completion rates ranged between 54% and 98% (*Mdn* = 85%), resulting in an average of 71 observations per participant. Two participants filled out less than 60% and were thus excluded from the analyses to ensure the validity and reliability of the results. This led to a final sample size of 21.

Descriptive Data

Table 1

Demographics Grouped by Gender

Baseline characteristic	Female	Male
Age (yrs)		
Number	14	7
Mean (*SD*)	22.79 (2.04)	23.43 (3.10)
Minimum	19	20
Maximum	26	28
Nationality		
German	9	6
Dutch	2	0
Lithuanian	1	0
Polish	1	1
Spanish	1	0
Occupation		
Student	13	5
Part-time working	1	3
Full-time working	0	0
Unemployed	1	0
Other	1	2
Relationship status		
In a relationship	9	2
Single	5	5
Mentalisation		
Mean (*SD*)	5.44 (0.96)	5.77 (0.95)
Minimum	2	2.67
Maximum	7	7
Epistemic Trust		
Mean (*SD*)	4.77 (1.08)	4.91 (1.19)
Minimum	1	2
Maximum	7	7

Note. Total number of observations for mentalisation and epistemic trust was female = 1039 and male = 515.

Participants were aged between 19 and 28 years (M = 23; SD = 2.39; Mdn = 23). All identified as either male (33.33%) or female (66.67%) and were either single (47.62%) or in a relationship (52.38%). A majority of the respondents were German (71.43%) and students (85.71%). See Table 1 for further demographical data and mean scores. The response rates for the contextual questions can be found in Table 2.

Table 2

Summary of the Contextual Variables (Social Company and Current Activity)

Category	Count
Social company	1504
Alone	630
Unknown people/strangers	94
Acquaintances	780
Co-worker/fellow student	141
Family	106
Friends	426
Romantic partner	107
Current Activity	1504
Relaxation	688
Relaxing	423
Socialising	265
Stress	390
Doing some physical activity	76
Studying	224
Working	90
Other	426

Figure 1 shows the unstandardised values for mentalisation and epistemic trust per participant for all time points. A strong variability within participants of both mentalisation and epistemic trust can be seen throughout the study duration.

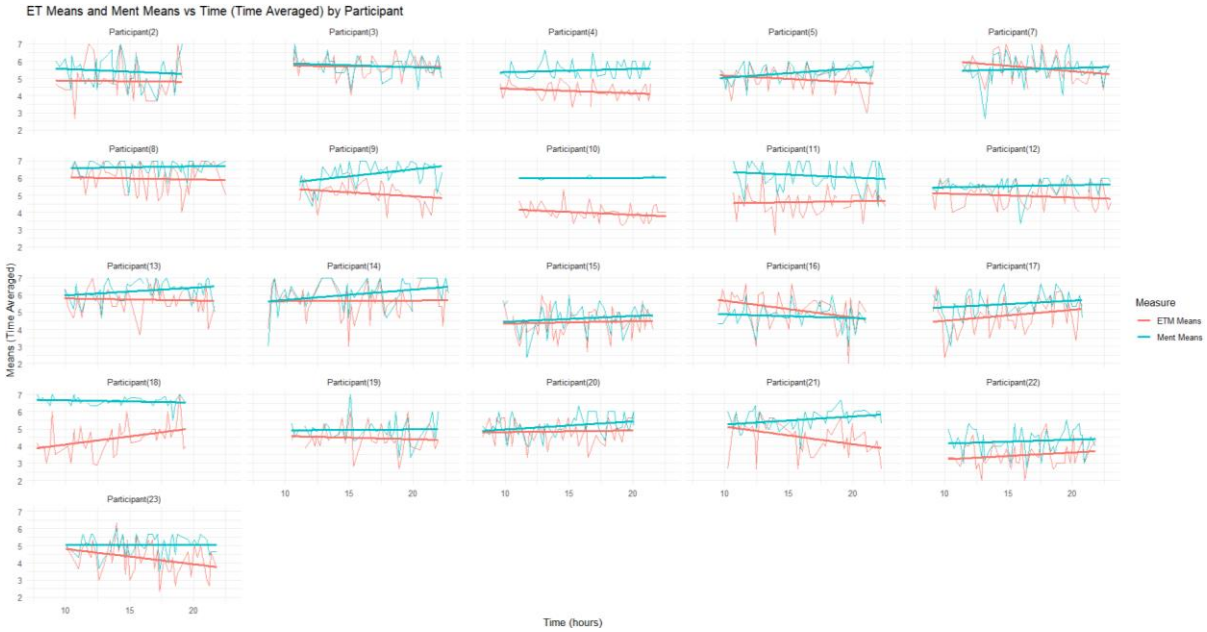
Model Performances

For each model (effects of time of the day, social company, or current activity on mentalisation or epistemic trust), the model assumptions was visually assessed. All models which had mentalisation as a dependent variable showed some discrepancies in the observed and model-predicted data: The observed data did not closely follow a bell-shaped distribution. In contrast, this did not occur in the models which had epistemic trust as a dependent variable (with exception of time of the day as a predictor); the distributions of these models closely followed the bell-shaped distribution of the predicted data. None of the models had homogeneity of variance or normal residuals. For all models with mentalisation

as a dependent variable, as well as time of the day vs epistemic trust, the linearity assumption is marginally violated as the observed distribution does not closely represent reference line.

Figure 1

Mean Epistemic Trust (red line) and Mentalisation (blue line) Scores per Measurement Point



Note. Participant 1 and 6 were excluded due to low completion rate.

Hypotheses

The results of the LMEs assessing the influence of time of the day on mentalisation and epistemic trust can be found in Tables 3 and 4, respectively. For mentalisation, there was a minimal effect of time of the day. Both the intercept and the coefficients were significant. This positive estimate for time indicates that mentalisation tended to increase over the day.

Table 3

LME Model Predicting the Influence of Time of the Day on Mentalisation

					95% CI	
Measure	Estimate	*SE*	*t*-value	*p*-value	Lower	Higher
(Intercept)	5.25	0.16	32.48	< .001	4.93	5.57
Time (hrs)	0.02	0.01	3.5	< . 001	0.01	0.03

Note. SE = Standard error. (Intercept) is time of the day = 0, i.e. midnight. CI = 95% Confidence Interval.

For epistemic trust, the estimate for time of the day on the dependent variable was negative and minimal. Both the intercept and the coefficients were significant. The negative time estimate indicates a decrease of epistemic trust over the day.

Table 4

LME Model Predicting the Influence of Time of the Day on Epistemic Trust

					95% CI	
Measure	Estimate	*SE*	*t*-value	*p*-value	Lower	Higher
(Intercept)	5.12	0.18	29.06	< .001	4.77	5.46
Time (hrs)	-0.02	0.01	-2.52	.011	-0.03	-0.00

Note. SE = Standard error. (Intercept) is time of the day = 0, i.e. midnight. CI = 95% Confidence Interval.

Then, the influence of social company on mentalisation was examined. The results of the LME can be found in Table 5. Being with acquaintances, compared to being alone, was associated with significantly higher scores in mentalisation. Being with strangers showed a nonsignificant and negative effect compared to being alone.

Table 5

LME Model Predicting the Influence of Social Context on Mentalisation

					95% CI	
Measure	Estimate	*SE*	*t*-value	*p*-value	Lower	Higher
(Intercept)	5.4	0.14	38.52	< .001	5.12	5.68
Acquaintances	0.3	0.04	7.48	< . 001	0.22	0.38
Strangers	-0.05	0.08	-0.64	0.523	-0.22	0.11

Note. SE = Standard error. (Intercept) is the category *being alone*. CI = 95% Confidence Interval.

Next, an LME was created to determine the influence of social company on epistemic trust (Table 6). All effect sizes were significant. Being with acquaintances had a significant, positive influence on epistemic trust, while being with strangers had a significant, negative

effect. This is in contrast to the effect of being with strangers (compared to being alone) on mentalisation, which was smaller and non-significant.

Table 6

LME Model Predicting the Influence of Social Context on Epistemic Trust

					95% CI	
Measure	Estimate	*SE*	*t*-value	*p*-value	Lower	Higher
(Intercept)	4.7	0.14	33.13	< .001	4.43	5
Acquaintances	0.28	0.05	5.46	< . 001	0.18	0.38
Strangers	-0.24	0.11	-2.27	0.023	-0.45	-0.03

Note. SE = Standard error. (Intercept) is the category *being alone*. CI = 95% Confidence Interval.

Third, an LME was created to determine the influence of current activities on mentalisation (Table 7). Both engaging in stressful and relaxing activities yielded significant effect sizes. Relaxing activities increased mentalisation compared to stressful activities.

Table 7

LME Model Predicting the Influence of Current Activity on Mentalisation

					95% CI	
Measure	Estimate	*SE*	*t*-value	*p*-value	Lower	Higher
(Intercept)	5.49	0.14	38.8	< .001	5.21	5.77
Relaxation	0.16	0.05	3.36	< . 001	0.07	0.26
Other	-0.04	0.05	-0.76	0.447	-0.15	0.06

Note. SE = Standard error. (Intercept) is the category *stressful activities*. CI = 95% Confidence Interval.

The fourth LME measured the influences of current activities on epistemic trust (Table 8). All effect sizes were significant. Both, relaxing and other activities decreased epistemic trust compared to stressful activities. Compared to its effect on mentalisation, the effect of other activities on epistemic trust increased and became significant. Another difference is that while the effect of relaxing activities on mentalisation was positive, the effect of relaxation on epistemic trust was negative.

Table 8

LME Model Predicting the Influence of Current Activity on Epistemic Trust

					95% CI	
Measure	Estimate	*SE*	*t*-value	*p*-value	Lower	Higher
(Intercept)	5.0	0.14	24.0	< .001	4.72	5.29
Relaxation	-0.2	0.06	-3.26	.001	-0.32	-0.08
Other	-0.26	0.07	-3.78	< .001	-0.39	-0.13

Note. SE = Standard error. (Intercept) is the category *stressful activities*. CI = 95% Confidence Interval.

For all models, the conditional R-squared lay between .30 and .44. Models including social company had the highest marginal R-squared values were (.025 and .021), while for all other models, the marginal R-squared lay between .003 and .009. This means that for the models including social company, a relatively high proportion of explained variance is due to the within-person variance. The standard deviation of the random effects (σ) ranged from 0.73 to 0.94, suggesting that a substantial variability in the dependent variables are due to the random effects.

Discussion

The present study investigated the fluctuations of both mentalisation and epistemic trust throughout the day and depending on different circumstances, such as social company and current activities in a general population. It was hypothesised that both mentalisation and epistemic trust fluctuate throughout the day and that the social environment and current activities influence mentalisation and epistemic trust. For example, it was expected that physical and mental stressors decrease mentalisation and that being with acquaintances increases epistemic trust.

Support was found for hypothesis 1: There were significant effects for time of the day on mentalisation and epistemic trust. Mentalisation significantly increased over the course of the day (see Table 3) and epistemic trust decreased towards the end of the day (see Table 4). For hypothesis 2, it can be concluded that some activities and social surroundings significantly affect mentalisation and epistemic trust. For social context, being with acquaintances significantly increased mentalisation as compared to being alone. Epistemic trust was significantly higher when with acquaintances, and significantly lower with

strangers. Relaxing activities had a significant positive influence on mentalisation. Interestingly, they had a significant negative influence on epistemic trust. Epistemic trust was significantly lower when engaging in *other* activities.

Based on the findings of the LMEs, it can be concluded that there is a significant increase in mentalisation and decrease in epistemic trust throughout the day. For H2, it can be concluded that some activities and social surroundings significantly affect mentalisation and epistemic trust. In line with the hypothesis, relaxation had a positive effect on epistemic trust. Interestingly, the opposite effect was found for epistemic trust, where relaxation negatively influenced the estimates. In line with expectations, epistemic trust was higher when being with acquaintances, compared to being alone. Thus, it can be concluded that social influences and current activities significantly influence both mentalisation and epistemic trust. However, it has to be noted that the categories in which the values were grouped (e.g., stressful vs relaxing activities) were rather arbitrary. Consequently, it can be concluded that both mentalisation and epistemic trust fluctuate throughout the day; not only based on the time of the day, but also based on what a person is doing and who they are with.

The finding that mentalisation is influenced by different contextual factors is consistent with Luyten et al. (2020) who argued that mentalisation is state- and context-dependent. Additionally, both Lyuten et al. (2020) and Locati et al. (2023) argued that mentalisation may not only be context-dependent but also influenced by epistemic trust. As the potential interactions between mentalisation and epistemic trust were not tested for in this paper, future research could focus on the possible interactions between these variables. Although it was shown that mentalisation and epistemic trust are context-dependent, research has shown that some people score generally higher or lower on both mentalisation and/or epistemic trust. Thus, it is likely that both concepts are not either state- or trait-like, but that although a person may be less epistemically trusting, their trust will depend on their social environment and current activities.

Additionally, it was found that mentalisation was significantly higher when engaging in relaxing activities compared to engaging in stressful activities. This is in line with Luyten et al. (2020), who argue that mentalisation is more refined in the absence of stress. However, it is hard to determine the extent of discrepancy between the scores of stressful and relaxing activities as the scales were not standardised. Thus, it cannot be said whether scores of relaxation and stress differed a lot or only marginally. Additionally, it may be that the scale used does not measure mentalisation in the way intended by the researchers. Thus, it would

be insightful to determine whether these differences are due to an underlying mechanism that was not accounted for in the analytical model or due to the scales used in the research.

Strengths and Limitations

The study did not rely on cross-sectional data but used within-person measures. This made it possible to measure the variability of the constructs in the first place and shows the importance of ESM in research. Using conventional methods and cross-sampling, these results could not have been found. The study had a high response rate of 85% on average and the multiple measurements per day enable drawing meaningful conclusions from the data with over 1500 observations per variable. Thus, this study enabled unique insight into the momentary fluctuations of mentalisation and epistemic trust. It also helped fill the research gap proposed by a multitude of researchers (Myin-Germeys et al., 2018; Luyten et al., 2020; Müller et al., 2023), contributing to the understanding of mentalisation and epistemic trust in daily life.

An important limitation is the simplicity of the LME models. Although they were able to show the significance between mentalisation and epistemic trust, respectively, with time of the day, they only showed whether either measure increased or decreased over the course of the day, but not the fluctuations. Furthermore, LME models do not assess causation, but correlation. Moreover, there are basic assumptions that need to be met for an LME to be used for research. However, visual inspection showed of the models showed no homogeneity of variance or normality of residuals. Additionally, some models did not show a congruence of observed vs predicted data and the linearity assumption may have been violated. These are serious statistical limitations, as the analytical approach used may not have been able to capture the data correctly. Thus, using an LME was an oversimplistic approach to determine the statistical significance, but not the actual fluctuations. For this, a generalised additive model could be used, which adds splines to the model to better approximate the real distribution of the data. However, this approach requires more data (Hastie & Tibshirani, 2014) and is outside the scope of a Bachelor's thesis.

Another limitation is that the items used to assess mentalisation and epistemic trust were not validated. As no validation of the measures took place, it cannot be proven that the measurements are valid and reliable. Thus, future researchers would need to first validate the scales before re-using them or replicating this study.

Moreover, the sample size of the study was small and thus more susceptible to outliers. Although the total number of observations was high (1,554 in total), the sample from which they were taken was small ($N = 21$). The study was the first of its kind, therefore a

small sample size was enough to explore the possible relationships between the variables. However, a replication study with a bigger sample size may decrease uncertainty in the estimates and ideally confirm the model.

Another limitation is the lack of diversity in the sample. Most participants were German students, which heavily limits the generalisability to the daily life of middle-European students. It could be that epistemic trust, mentalisation, and well-being are influenced differently in people who are either younger (e.g., children and teenagers) or older (e.g., fully-grown adults), i.e. that specific situations have less influence on epistemic trust in older people compared to younger people. Additionally, it is not known whether these concepts differ in students compared to working people. It could be that these two populations experience different levels of e.g., epistemic trust. For instance, a person who has responsibility for others may not be so willing to trust the information communicated by another person. Additionally, work climate may influence mentalisation, epistemic trust, and well-being.

These limitations impact the conclusions which can be drawn from the study because one needs to assume that the scales measure the respective constructs in a valid and reliable way. Future researchers would need to validate the scales before they could use them, for example by comparing the scores of the CAMPSQ with the results of the scale used in this study. Nevertheless, it may be that the results still differ as the scales were used to measure a momentary picture and the CAMPSQ is used to assess mentalisation as a trait-like construct.

Conclusion

This study was the first of its kind to apply ESM to mentalisation and epistemic trust. It examined the possible relations between these concepts and situational factors, such as time of the day, social company, and activities. The results show that both mentalisation and epistemic trust are influenced by the time of the day, what someone is doing and who that person is with. Especially the influence of social surroundings and current activities has important applications for decision-making, work climate, and psychotherapy. Thus, mentalisation and epistemic trust may not solely be stable traits, but rather dynamic and context-dependent. However, further research is needed to validate the scales used in the study to further build on its results.

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Appendix A

Informed consent form

Dear Participant,

Thank you for participating in this study!

Brief summary of the study:

This research aims to investigate the relationship between subjective well-being, epistemic trust, and mentalization using Experience Sampling Methods (ESM).

The primary purpose of this research is to investigate how individuals' levels of epistemic trust and mentalization fluctuate throughout the day and how the interaction between these factors impacts mental health and well-being.

Procedures:

You will be asked to complete an entry survey providing background information and a personality test based on the Big Five model.

If you agree to participate, you will be required to download the m-path app and answer multiple questions multiple times a day.

Participation involves answering questions related to your epistemic trust, mentalization, and well-being.

Risks and Benefits:

Participation in this study involves minimal risk. Some questions may prompt self-reflection, potentially leading to mild emotional discomfort. However, measures are in place to provide support if needed. The benefit of contributing to psychological research and understanding human behaviour is a potentially positive outcome. Participants who complete 80% of the daily prompts will have the chance to win a 50 Euro Amazon voucher as a token of appreciation.

Confidentiality:

All data collected will be treated confidentially. Your answers will be anonymized and handled with confidentiality. Only the research team will have access to the data.

Voluntary Participation:

Participation in this study is voluntary. You have the right to withdraw at any time without any consequences.

Contact Information:

If you have any questions or concerns, please contact one of the researchers:

a.m.sessmann@student.utwente.nl

d.e.zawadzka@student.utwente.nl

m.u.s.steins@student.utwente.nl

To participate in this study, we need to ensure that you understand the nature of the research, as outlined in the summary of the study. Please confirm at the bottom of the page to indicate that you understand and agree to the following conditions:

Consent Form for Understanding the Relationship Between Mentalization, Mental Health, and Epistemic Trust

Please tick the appropriate boxes	**Yes**	**No**

Taking part in the study

I have read and understood the study information dated [DD/MM/YYYY], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	□	□
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	□	□
I understand that taking part in the study involves answering questions multiple times a day on epistemic trust, mentalization and overall well-being.	□	□

Use of the information in the study

I understand that information I provide will be used for research purposes.	□	□
I understand that personal information collected about me that can identify me, such as [e.g. my name or where I live], will not be shared beyond the study team.	□	□

Future use and reuse of the information by others

Signatures

_____	_____	
Name of participant	Signature	Date

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee/domain Humanities &

Social Sciences of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by ethicscommittee-hss@utwente.nl

Appendix B

Scale	Description	Reply Options
ESM		
Current Activity	What are you doing right now?	Working; studying; relaxing; doing some physical activity; socialising; other
Current Company	Who are you with right now?	I am alone; family; friend(s); romantic partner; co-worker/fellow student; unknown people/strangers
Mentalisation		
CAMPSQ 4	I understand why certain things make me happy right now.	Likert Scale*
CAMPSQ 9	I understand my feelings right now.	Likert Scale*
CAMPSQ 16	I currently know the reason for my behaviour.	Likert Scale*
Epistemic Trust		
Item 1	I currently feel open to absorbing new information.	Likert Scale*
Item 2	I don't feel like learning new things from others right now.	Likert Scale*
Item 3	I currently feel I can rely on my knowledge to make decisions.	Likert Scale*

Note. *The Likert scale ranged from 1 (*not at all*) over 4 (*neutral*) to 7 (*very much*).