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Research paper

Mentalizing, epistemic trust and interpersonal problems in emotion regulation: A sequential path analysis across common mental health disorders and community control samples

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ABSTRACT

Background: Emotion regulation is a crucial function implicated in multiple mental health disorders; understanding the mechanisms by which emotion regulation has such impact is essential. Mentalizing has been posited as a prerequisite for effective emotion regulation. The current study aims to examine the roles of epistemic trust and interpersonal problems in driving the association between mentalizing and emotion regulation, contrasting clinical and non-clinical populations.
Method: A total of 652 individuals (296 clinical and 356 community control) were employed. Sequential mediation analysis was used to examine the role of epistemic stances and interpersonal problems in the mentalizing-emotion regulation link, and moderated mediation analysis was conducted to identify group differences in these pathways.
Results: Ineffective mentalizing was associated with emotion dysregulation and interpersonal problems. Higher levels of epistemic credulity and mistrust were associated with ineffective mentalizing, interpersonal problems, and emotion dysregulation. Sequential mediation analysis indicated that disruptions in epistemic trust (epistemic mistrust and credulity) and interpersonal problems partially mediated the relationship between inadequate mentalizing and emotion dysregulation, with these pathways being consistent across both clinical and control groups. The pathways including epistemic trust were not significant.
Limitations: The study's limitations include a simplified theoretical model, a cross-sectional design preventing causal inference, and sample recruitment methods possibly limiting generalizability.
Conclusions: These findings suggest a potential mechanism connecting mentalizing, disruptions in epistemic trust, interpersonal problems, and emotion regulation, to illuminate a crucial aspect of psychological functioning. These results emphasize the significance of social-communicative aspect in clinical outcomes.

1. Introduction

Emotion regulation draws on both internal and external social cognitive processes that enable individuals to observe, evaluate and modulate the intensity, speed, and persistence of emotional reactions to achieve their aims in a particular situation (Nolen-Hoeksema, 2012; Thompson, 1994). While earlier research predominantly conceptualized emotion regulation as an intrapersonal process, recent studies have

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underscored the significant interplay between individual and social factors in shaping emotional experiences and regulatory functions, highlighting the critical role of interpersonal dynamics in emotion regulation (Campos et al., 2011; Christensen and Haynos, 2020; Messina et al., 2021). The social environment is thus thought to play a significant role in shaping an individual's emotional state and regulatory strategies (Tamir and Ford, 2012), with poor emotion regulation potentially leading to negative social outcomes, thereby potentially creating an unhelpful cycle of dysregulation and social dysfunction (Stepp et al., 2014).

The effectiveness of emotion regulation is typically evaluated by its ability to support the achievement of desired outcomes, with failures in this domain often resulting in intense, persistent, and uncontrollable negative emotions, which are associated with a variety of psychopathologies (see e.g., Berking et al., 2014; Conroy et al., 2020; Daros and Williams, 2019; Ruscitti et al., 2016; Seligowski et al., 2015). Consequently, emotion regulation is recognized as a transdiagnostic factor underpinning common mental health problems (Fernandez et al., 2016; Sloan et al., 2017), emphasizing the necessity of exploring the mechanisms that support effective emotional control (Blay et al., 2024). Furthermore, the capacity for adaptive emotion regulation is associated with positive mental health outcomes and is considered a protective factor, emphasizing its significance in fostering well-being across both individuals with and without clinical conditions (Aldao and Nolen-Hoeksema, 2012; Trompetter et al., 2016).

Mentalizing, the imaginative capacity to perceive and interpret both one's own and other people's behaviour in terms of intentional mental states (e.g., goals, feelings, desires, needs, reasons), has been postulated as a prerequisite for effective emotion regulation (Fonagy et al., 2004; Greenberg et al., 2017). Similar to emotion regulation, mentalizing is viewed as a fundamental process drawn up by a range of psychological functions (Fonagy and Allison, 2011). Despite a few contradictory findings (Ballespí et al., 2018; Pedersen et al., 2015), ineffective mentalizing have been identified in various forms of adult psychopathology (see e.g., Ballespí et al., 2021; Fischer-Kern et al., 2022; Huang et al., 2020; Rifkin-Zybutz et al., 2021). The developmental trajectory linking mentalizing and emotion regulation is partially rooted in early developmental experiences, particularly within the context of attachment relationships (Fonagy et al., 2004), where the development of emotion regulation lays the groundwork for the later emergence of mentalizing abilities (Sharp et al., 2011). As mentalizing matures, it supports the capacity for emotion regulation, enabling the modulation of self and affective states by interpreting behaviours in terms of mental states (Fonagy and Allison, 2011). This developmental perspective has been further elaborated to incorporate the impact of social learning and the transmission of cultural knowledge on psychological development, with a particular focus on epistemic trust— the ability to accept and regard interpersonally transmitted knowledge as personally meaningful, trustworthy, and generalizable—as a potential mechanism in the dynamic interplay between mentalizing and emotion regulation (Fonagy and Luyten, 2018).

Epistemic trust is critical for individuals to assimilate new information and engage effectively with their ever-changing social surroundings (Fonagy and Allison, 2014). An essential aspect of this process is the ability to adopt a suitable epistemic stance —that is, appropriately judging whether to trust or mistrust another— necessitating the accurate interpretation of communicators' intentions, which is closely linked to mentalizing abilities. Ineffective mentalizing can hinder the formation of an "epistemic match," where the individual accurately perceives the communicator's intentions as both reliable and benevolent (Fonagy et al., 2021). Disruptions in epistemic trust, whether due to mentalizing impairments, early adversities affecting trust, or a combination thereof, can culminate in epistemic mistrust. This is a state where others' actions and motives are perceived as potentially harmful or malevolent, fostering a guarded stance that undermines the acceptance of socially transmitted knowledge due to heightened suspicion (Allison and Fonagy, 2016). Conversely, disruptions in epistemic trust can also manifest as epistemic credulity, marked by an undue lack of discrimination in relation to social communication, which increases susceptibility to misinformation (Campbell et al., 2021). Furthermore, some individuals may experience both profound mistrust and credulity, creating an "epistemic dilemma". This complex condition is particularly associated with personality disorders (Campbell and Fonagy, 2022; Nolte et al., 2023; Preti et al., 2023), illustrating the complex interdependencies between mentalizing, epistemic trust, and their broader implications for psychological well-being and interpersonal relations.

A decline in mentalizing capabilities may diminish interest in the content of communication and the exchange of social information, with a shifting preference towards concrete outcomes, which can escalate into interpersonal conflicts triggering strong emotional responses (Euler et al., 2021). Moreover, poor mentalizing may compromise social functioning and lead to misunderstandings of social cues, resulting in a failure to recognize ostension— the detection of personal relevance in communication. This impediment, which undermines epistemic trust, restricts one's ability to learn from or adjust behaviours based on social experiences, thereby hindering salutogenesis, the process of deriving benefits from social environments (Nolte et al., 2023). This disruption, coupled with other factors, may impair an individual's capability to navigate social contexts effectively. Lacking effective strategies for social learning and cognitive adaptability, individuals might struggle to adjust to the dynamic nature of social environments, potentially leading to increased isolation and susceptibility to further social and interpersonal difficulties (Fonagy et al., 2017). This compromised social functioning could result in heightened negative emotions and an elevated risk of developing psychopathological conditions (Li et al., 2023).

The intricate interplay among mentalizing, epistemic trust, interpersonal problems, and emotion regulation has been a focal point of theoretical discussions regarding their collective impact on psychological well-being, yet empirical studies in this area are only emerging. Studies have shown that improved mentalizing can enhance emotion regulation (Schwarzer et al., 2021) and reduce interpersonal distress (De Meulemeester et al., 2017; Hayden et al., 2018). Recent research, such as that by Parolin et al. (2024), expanded this by incorporating epistemic trust, finding it to be linked with mentalizing but not with symptomatology in adolescents. Their study differentiates the roles of epistemic mistrust and credulity in internalizing symptoms, with mistrust having both direct and indirect effects, while the impact of credulity was primarily indirect, via emotional dysregulation. Studies indicate the adverse effects of disrupted epistemic trust on mentalizing (Hauschild et al., 2023; Liotti et al., 2023) and emotion regulation (Parolin et al., 2024). Notably, the relationship between interpersonal problems and epistemic trust in the context of psychopathology remains unexplored, marking a significant gap in the current literature. Building upon these preliminary insights, our study aimed to investigate the mediating roles of epistemic stance (i.e., epistemic trust, mistrust and credulity) and difficulties in interpersonal function in the relationship between ineffective mentalizing and emotion regulation difficulties. Through an exploratory analysis contrasting a clinical sample with a non-clinical community sample, we aim to examine how these dynamics differ between groups, thereby enhancing our understanding of the social cognitive processes that increase the risk of psychopathology. The initial hypotheses were pre-registered as part of a larger project, which is accessible on the Open Science Framework (osf.io/m3u9k).

The pre-registered hypotheses are as follows:

1) There will be associations between mentalizing, epistemic stance, interpersonal difficulties, and affect regulation. Specifically: a) Ineffective mentalizing will be associated with higher levels of epistemic mistrust and credulity, more interpersonal problems, greater difficulties in affect regulation, and lower levels of epistemic trust. b) Higher levels of epistemic mistrust and credulity, along with lower levels of epistemic trust, will be related to more interpersonal problems and greater impairments in emotion regulation. c) Interpersonal problems will be

associated with emotion dysregulation.

2) Epistemic stance and interpersonal problems will serve as serial multiple mediators in the relationship between mentalizing and emotion regulation.

2. Methods

2.1. Study design and procedure

The current study forms part of a larger project entitled "Probing Social Exchanges – A Computational Neuroscience Approach to the Understanding of Major Depressive Disorder." (see previous publications e.g., Michael et al., 2021; Wendt et al., 2019, 2022). The recruitment procedure of the current sample has been detailed in a previous paper (Kumpasoglu et al., under review). The clinical sample was recruited via two NHS Talking Therapies for Anxiety and Depression (NHS TTad) services in Greater London, which offer evidence-based psychological treatments for depression and anxiety-related disorders. The community control sample was reached through an online survey website (Profilic.co). Inclusion criteria for the current study included proficiency in English, an age range of 18 to 60 years, the absence of neurological disorders or trauma history, and the absence of current symptoms related to psychotic, bipolar disorders, or substance abuse. Furthermore, individuals in the clinical group were required to be considered suitable for NHS TTad-delivered treatment. Eligibility for TTad services is determined by clinicians who use ICD-10 codes to match individuals with specific treatments, also considering self-reported symptom severity, sociodemographic factors, and the impact on social and occupational functioning (The National Collaborating Centre for Mental Health, 2021). Community control participants had additional requirements: no previous history of mental disorders, absence of ongoing psychological services utilization, and failure to meet the distress criteria of the Brief Symptom Inventory (BSI); specifically, not achieving $T \geq 63$ in the Global Severity Index or at least two dimensions of the BSI (Derogatis, 1983; Franke et al., 2021). The community participants who scored above the recommended cut-off criteria on the BSI ($N = 70$) were removed from the sample. Prior written informed consent was obtained from all participants, and the questionnaires were completed online. Each participant received £7.50 per hour as compensation for their time and effort. The larger study received approval from the London Queen Square Research Ethics Committee (REC number 16/LO/077). The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

2.2. Participants

The current sample included 652 individuals (471 females, 172 males, and 9 transgender individuals), with an average age of 33.37 (SD = 10.83). Of these, 356 participants belonged to the community control group, while 296 were classified as clinical participants. The education levels ranged from no qualification (2 %) to postgraduate education (24.5 %), with the majority of the participants having completed higher education (38.2 %). The majority of the participants had either a household income of less than £10,000 (25 %) or between £10,000 to £35,000 (26.4 %). Detailed information regarding participants' demographic characteristics was given in the Supplementary Material.

The clinical cohort was characterized using problem descriptors provided by NHS TTad services. The most prevalent diagnoses included depression ($N = 96$, 32.4 %), generalized anxiety disorder ($N = 54$, 18.2 %), post-traumatic stress disorder ($N = 27$, 9.1 %), and social phobia ($N = 22$, 7.4 %). Less common conditions included obsessive-compulsive disorder ($N = 15$, 5.1 %), hypochondriasis ($N = 12$, 4.1 %), and mixed anxiety-depressive disorder ($N = 11$, 3.7 %). Rare diagnoses involved panic disorder ($N = 3$, 1 %), body dysmorphic disorder ($N = 2$, 0.7 %), eating disorders ($N = 3$, 1 %), and specific phobia ($N = 3$, 1 %). Additionally, 25 participants (8.4 %) had no problem descriptors available, while 23 participants (7.8 %) were reported as having no specified conditions. Further details on participants' clinical characteristics are provided in Supplementary Material.

2.3. Instruments

2.3.1. Difficulties in Emotion Regulation Scale (DERS)

The DERS is a 36-item self-report questionnaire developed by Gratz and Roemer (2004) based on their multidimensional model of emotion regulation. This tool assesses the frequency with which respondents encounter specific situations, with higher scores reflecting greater difficulties in emotion regulation. Previous research has demonstrated that the DERS has adequate internal consistency in both clinical (Fox et al., 2007) and non-clinical populations (Neumann et al., 2010). In the current study, the scale exhibited excellent reliability ($\omega = 0.97$).

2.3.2. The Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ)

The ETMCQ is a recently developed questionnaire designed to assess three epistemic stances: epistemic trust, mistrust, and credulity (Campbell et al., 2021). While the original 18-item version of the scale was used during data collection, analyses were conducted after including three items that had been previously excluded from the scale. Scoring for the ETMCQ involves calculating the raw average values for each subscale, with higher scores indicating greater levels of the respective epistemic stance. All subscales have shown adequate internal consistency and validity (Campbell et al., 2021). In the current sample, McDonald's omega (ω) values for the trust, mistrust, and credulity subscales were 0.73, 0.73, and 0.76, respectively.

2.3.3. Inventory of Interpersonal Problems (IIP-32)

The IIP-32 is a brief self-report questionnaire designed to identify common issues in interpersonal functioning (Horowitz et al., 2000). It has eight subscales corresponding to specific areas of interpersonal problems labelled as "domineering/controlling, vindictive/self-centred, cold/distant, socially inhibited, non-assertive, overly accommodating, self-sacrificing, and intrusive/needy". Each subscale contains four items, and scores are typically calculated either by summing the raw scores of individual items or by aggregating the subscale totals. Higher scores on any given subscale indicate more pronounced difficulties related to that interpersonal style. The IIP-32 has demonstrated high internal consistency in the current sample ($\omega = 0.90$)

2.3.4. Mentalizing Questionnaire (MZQ)

MZQ is a 15-item self-report questionnaire which aims to assess four mentalizing dimensions: refusing self-reflection, emotional awareness, psychic equivalence mode, and reflection of affect (Hausberg et al., 2012). The total score is calculated by summing responses across all items, with higher scores indicating of greater difficulties in mentalizing in this study. The scale showed good reliability in our sample ($\omega = 0.85$).

2.4. Statistical analyses

There were no missing values within the instruments. Prior to conducting the mediation analyses, the data were scrutinised for any potential outliers. Two multivariate outliers were identified by Mahalanobis distance and subsequently removed from the dataset (Tabachnick and Fidell, 2012). All variables exhibited relatively normal distributions, as indicated by absolute skewness values <2 and kurtosis values <7 (Kim, 2013). For the independent variables, variance inflation factors (VIF) were below 10 and tolerance scores were above 0.2 (Tabachnick and Fidell, 2012) indicating that there was no multicollinearity violation. All diagnostic interpretations suggested that the data were suitable for further statistical analyses.

R statistical software (RStudio- 2023.03.0) was used in the analyses

with the "Hmisc" (Harrell and Dupont, 2023) and "cocor" packages (Diedenhofen and Musch, 2015) and the "PROCESS" macro (Hayes, 2022). Zero-order Pearson correlation analyses were conducted to test the associations between epistemic stance, mentalizing, emotion regulation, and interpersonal problems. To further investigate the association between epistemic stance and specific dimensions of interpersonal difficulties, we conducted a comparative analysis of correlation patterns across the interpersonal problems subscales. This analysis aimed to elucidate variations in interpersonal dynamics among individuals with differing epistemic stances, enhancing the understanding of how these stances influence relational behaviours.

To explore the potential mediating roles of disruptions in epistemic trust and interpersonal problems on the relationship between mentalizing and emotion regulation, a sequential mediation analysis, including epistemic trust, mistrust, credulity, and interpersonal problems as potential mediators, was performed using Hayes's PROCESS macro [Model 80] (Hayes, 2022). Further exploratory analyses, which were not preregistered, employed moderated mediation analyses using Model 92 of Hayes's PROCESS macro. This analysis explored each pathway, involving epistemic trust, mistrust or credulity to test the moderating effect of group membership (i.e., belonging to a clinical or community control group) on these indirect pathways. The sample was divided into two groups: a clinical group (represented by 1) and a community control group (represented by 0). Both analyses were conducted while controlling for age, gender, household income and level of education. The significance of potential mediator variables was examined using 5000 bootstrap samples. This approach generated confidence intervals (CI), and indirect effects with bootstrapped 95 % CIs (95%bootCI) that did not include zero were considered statistically significant. This method requires very few assumptions about the distribution and provides a more accurate and powerful analysis of indirect effects (Preacher and Hayes, 2004; Wang and Preacher, 2015).

3. Results

3.1. Demographic and clinical characteristics across participant groups

Group differences in demographic variables (i.e., age, gender, household income, and education level) were evaluated. In relation to gender, due to the small number of participants who identified as transgender and the lack of detail in this category, these analyses were performed without these individuals. There was no gender ($X^2(1, N = 643) = 2.07, p = 0.15$), age ($t(650) = 1.50, p = 0.13$), or education level difference ($U = 54{,}159, p = 0.52$) among groups. However, annual household income was higher in the clinical group ($U = 67{,}254, p < 0.001$).

The findings indicate that the clinical group exhibited significantly higher levels of epistemic mistrust and credulity, as well as more pronounced interpersonal problems, all with medium effect sizes (see Table 1). Furthermore, this group demonstrated substantially greater difficulties with emotion regulation and mentalizing, both with large effect sizes. Interestingly, despite these challenges, the clinical group reported slightly higher scores in epistemic trust compared to the control group, although the effect size for this difference was small.

3.2. Bivariate correlations between variables

The results presented in Table 2 show significant correlations among key variables across the total sample, as well as within the clinical and community samples separately. As anticipated, ineffective mentalizing was strongly associated with difficulties in emotion regulation and interpersonal relationships across all groups. Similarly, both epistemic mistrust and credulity were strongly linked to ineffective mentalizing, elevated interpersonal difficulties, and increased challenges in emotion regulation in all samples.

Contrary to expectations, epistemic trust did not show significant associations with either interpersonal issues or mentalizing capacities in the total sample. Additionally, an unexpected small positive correlation was observed between epistemic trust and difficulties in emotion regulation, deviating from the predicted negative correlation. However, this correlation was not significant in the clinical or community samples, suggesting it might be a chance finding.

A particularly noteworthy result from the clinical sample was a significant negative correlation between epistemic trust and mentalizing capacities ($r = -0.27, p < 0.001$), which was not observed in the community control sample ($r = 0.05$, ns). The difference in these correlations between the clinical and community groups ($p < 0.001$) suggests that epistemic trust may have a more pronounced impact among individuals with mental health disorders. No other correlation differences between the clinical and community groups reached statistical significance, indicating broadly consistent patterns across the other examined relationships.

A more in-depth exploration of the relationship between interpersonal problems subscales and epistemic trust subscales was undertaken. We compared correlation patterns across the interpersonal problems subscales to explore how these stances influence relational behaviours. While both epistemic mistrust and credulity were significantly associated with all IIP-32 subscales in the total sample, it was found that epistemic mistrust demonstrated a stronger association with the cold/distant ($r = 0.42, p < 0.001$) and socially inhibited/avoidant ($r = 0.39, p < 0.001$) subscales. The correlation between epistemic mistrust and the cold/distant subscale was significantly higher than the correlation between mistrust and the vindictive/self-centred subscale ($r = 0.30$), which was found to be the most influential among the remaining subscales ($p < 0.001$). Similarly, the correlation between epistemic mistrust and the socially inhibited/avoidant subscale showed a significantly stronger association compared to the correlation between mistrust and the vindictive/self-centred subscale ($p = 0.02$). In both clinical and community control samples, similar patterns were observed, with epistemic mistrust linking more strongly to avoidance behaviours.

Epistemic credulity, on the other hand, was more strongly correlated with the subscales of intrusive/needy ($r = 0.41, p < 0.001$), overly accommodating/exploitable ($r = 0.40, p < 0.001$), and self-sacrificing/overly nurturant ($r = 0.38, p < 0.001$) in the total sample. The correlation between epistemic credulity and the intrusive/needy subscale was significantly stronger than the correlation between credulity and the non-assertive subscale ($r = 0.31, p < 0.001$), which was the subscale with the strongest association with epistemic credulity among the others ($p = 0.009$). Similarly, both the credulity– overly accommodating/exploitable association and the credulity–self–sacrificing/overly nurturant

Table 1
Group differences across each study variable.

	Community control group *M* (SD)	Clinical group *M* (SD)	MD	*t*	Cohen's d
Trust	4.75 (0.92)	5.12 (1.02)	−0.37	−4.86***	−0.39
Mistrust	3.87 (0.94)	4.61 (1.01)	−0.75	−9.73***	−0.77
Credulity	2.91 (1.05)	3.58 (1.23)	−0.67	−7.37***	−0.59
MZQ	38.57 (10.46)	38.57 (10.46)	−10.67	−13.14***	−1.03
IIP	34.62 (17.10)	48.36 (20.32)	−13.94	−9.37***	−0.75
DERS	77.75 (20.50)	107.72 (18.66)	−29.97	−19.36***	−1.52

Note. *** $p < 0.001$; MZQ, Mentalizing Questionnaire; IIP; Inventory of Interpersonal Problems; DERS, Difficulties in emotion regulation scale; MD; Mean difference.

Table 2
Zero-order correlations among variables.

	Mistrust	Credulity	MZQ	DERS	Interpersonal problems	PA	BC	DE	FG	HI	JK	LM	NO
Total sample													
Trust	−0.14***	0.19***	−0.004	0.10*	−0.02	−0.09*	−0.21***	−0.18***	−0.16***	0.05	0.08*	0.15***	0.23***
Mistrust		0.38***	0.62***	0.45***	0.45***	0.25***	0.30***	0.42***	0.39***	0.22***	0.27***	0.29***	0.18***
Credulity			0.44***	0.39***	0.45***	0.20***	0.16***	0.23***	0.21***	0.31***	0.40***	0.38***	0.41***
MZQ				0.65***	0.59***	0.28***	0.29***	0.46***	0.43***	0.39***	0.45***	0.40***	0.31***
DERS					0.54***	0.35***	0.25***	0.33***	0.31***	0.32***	0.39***	0.42***	0.43***
Clinical sample													
Trust	−0.33***	0.09	−0.27***	−0.01	−0.15*	−0.14*	−0.22***	−0.23***	−0.22***	−0.02	−0.04	0.00	0.14*
Mistrust		0.30***	0.54***	0.28***	0.41***	0.29***	0.27***	0.42***	0.39***	0.15*	0.17**	0.27***	0.13*
Credulity			0.36***	0.18**	0.47***	0.17**	0.19***	0.26***	0.26***	0.32***	0.40***	0.37***	0.39***
MZQ				0.48***	0.55***	0.29***	0.30***	0.51***	0.42***	0.35***	0.36***	0.33***	0.20***
DERS					0.40***	0.29***	0.23***	0.26***	0.22***	0.21***	0.25***	0.29***	0.32***
Community control sample													
Trust	−0.12*	0.19***	0.05	−0.03	−0.04	−0.10	−0.25***	−0.22***	−0.16***	0.06	0.10	0.17***	0.22***
Mistrust		0.33***	0.55***	0.33***	0.34***	0.12*	0.28***	0.35***	0.36***	0.19***	0.21***	0.08	−0.01
Credulity			0.37***	0.39***	0.31***	0.14**	0.07	0.12*	0.11*	0.23***	0.30***	0.23***	0.29***
MZQ				0.55***	0.48***	0.19***	0.21***	0.32***	0.40***	0.35***	0.38***	0.22***	0.17**
DERS					0.48***	0.34***	0.23***	0.27***	0.33***	0.31***	0.31***	0.23***	0.29***

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; MZQ, Mentalizing Questionnaire; DERS, Difficulties in emotion regulation scale; PA, IIP-32 Domineering/Controlling subscale; BC, IIP-32 Vindictive/Self-centered subscale; DE, IIP-32 Cold/Distant Subscale; FG, IIP-32 Socially Inhibited/Avoidant subscale; HI, IIP-32 Non-assertive subscale; JK, IIP-32 Overly Accommodating/Exploitable subscale; LM, IIP-32, Self-sacrificing/Overly nurturant subscale; NO, IIP-32 Intrusive/Needy subscale.

association showed stronger correlations than the credulity and the non-assertive association ($p < 0.001$ and $p = 0.037$, respectively). In the clinical and community control samples, epistemic credulity consistently demonstrated stronger associations with subscales reflecting a tendency towards over-involvement in relationships.

3.3. Direct and indirect effects of mentalizing on emotion regulation through epistemic stance and interpersonal problems

The direct and indirect effects of mentalizing on emotion regulation through epistemic stance and interpersonal problems are presented in Fig. 1 and Table 3. The model accounted for 44 % of the variance in emotion dysregulation ($R^2 = 0.44$, $F(5,637) = 101.01$,$p < 0.001$).

The results showed that mentalizing was not significantly associated with epistemic trust (b = −0.001[95%CI = -0.01;0.01],SE = 0.003,p = 0.81). However, ineffective mentalizing was associated with higher levels of epistemic mistrust (b = 0.06,[95%CI = 0.05;0.06],SE = 0.003, $p < 0.001$), epistemic credulity (b = 0.04,[95%CI = 0.04;0.05],SE = 0.004,$p < 0.001$) and interpersonal problems (b = 0.73,[95%CI = 0.60;0.86],SE = 0.07,$p < 0.001$). Finally, the direct effect of mentalizing on emotion regulation remained significant (b = 0.96[95%CI = 0.78;1.13],SE = 0.09,$p < 0.001$).

Epistemic trust showed no significant association with interpersonal problems (b = −1.20[95%CI = -2.52;0.11],SE = 0.67,p = 0.07). However, a small positive association was observed between epistemic trust and emotion regulation problems (b = 2.07[95%CI = -0.54;3.60], SE = 0.78,p = 0.08). Epistemic mistrust was positively associated with interpersonal problems (b = 1.59[95 % CI = 0.07;3.10], SE = 0.77, p = 0.04). However, the strong association between epistemic mistrust and emotion regulation difficulties was no longer significant (b = 1.34[95 % CI = -0.43;3.10],SE = 0.90,p = 0.14). Similarly, while epistemic credulity was positively associated with interpersonal problems (b = 3.97[95 % CI = 2.79;5.16], SE = 0.60, $p < 0.001$), its association with emotion regulation was no longer significant (b = 1.36[95%CI = -0.07;2.78],SE = 0.72,p = 0.06).

The outcomes of serial mediation analysis revealed that ineffective mentalizing was associated with higher levels of emotion regulation difficulties through the partial mediation of higher epistemic mistrust and greater interpersonal problems. The sequential pathway results were also significant for epistemic credulity (see Table 3).

3.4. Exploring the role of participant groups

The findings showed no significant moderation by group membership—distinguishing between clinical and community control groups—across several pathways. Specifically, the pathways of "Mentalizing → Trust → Emotion Regulation" (95%bootCI = −0.14;0.003), "Mentalizing → Mistrust → Emotion Regulation" (95%bootCI = −0.08;0.26), "Mentalizing → Interpersonal Problems → Emotion Regulation" (95% bootCI = −0.18;0.09) did not show statistically significant difference across clinical and community control groups.

None of the sequential pathways including "Mentalizing → Trust → Interpersonal Problems → Emotion Regulation"(95%bootCI = −0.004;0.02), "Mentalizing → Mistrust → Interpersonal Problems → Emotion Regulation"(95%bootCI = −0.03;0.05) or "Mentalizing → Credulity → Interpersonal Problems → Emotion Regulation" (95% bootCI = −0.01;0.06) did not show significant differences between groups, with bootstrap confidence intervals including zero. These findings suggest that the identified patterns of indirect effects apply consistently across both the clinical and community control groups.

However, notable differences emerged in only one pathway of our model. Group membership significantly moderated the "Mentalizing → Credulity → Emotion Regulation" pathway (95%bootCI = −0.24;-0.06). Epistemic credulity mediated the relationship between mentalizing and emotion regulation in the control group (b = 0.10[95%bootCI = 0.04;0.16], bootSE = 0.03), while it was not significant in the clinical

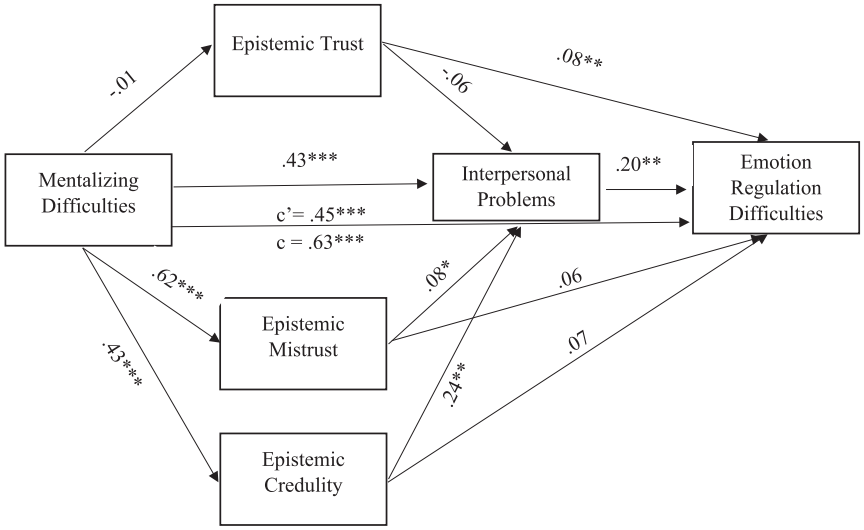

Fig. 1. Schematic model of the sequential mediating roles of the epistemic stance and interpersonal problems on the relationship between mentalizing and emotion regulation. *Note.* *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. The standardized path coefficients were reported.

Table 3
Standardized indirect effects of mentalizing on emotion regulation.

Model pathway	*B* (SE)	95%bootCI	
		Lower	Upper
MZQ → Trust→ DERS	−0.001 (0.004)	−0.01	0.01
MZQ → Mistrust→ DERS	0.03 (0.02)	−0.01	0.09
MZQ → Credulity→ DERS	0.03 (0.02)	−0.002	0.06
MZQ → Interpersonal Problems→ DERS	0.09 (0.02)	0.05	0.12
MZQ → Trust→ Interpersonal Problems→ DERS	0.0001 (0.001)	−0.001	0.001
MZQ → Mistrust→ Interpersonal Problems→ DERS	0.01 (0.01)	0.0004	0.02
MZQ → Credulity→ Interpersonal Problems→ DERS	0.02 (0.01)	0.01	0.03

group (b = −0.05[95%bootCI = −0.19;0.08],bootSE = 0.07).

3.5. Exploring alternative paths

In exploring alternative pathways not pre-registered in the original study design, we examined the relationship between mentalizing and emotion regulation difficulties through the sequential mediation of interpersonal problems and epistemic stances. Both the original and alternative models were statistically significant; however, the alternative model demonstrated a better fit, as evidenced by moderately lower Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values (ΔAIC = 3.16; ΔBIC = 3.17). Notably, in this alternative model, none of the sequential pathways involving epistemic stances reached statistical significance (see Supplementary Material for details).

Additionally, based on correlations observed in the subscale scores of the IIP, we explored two distinct pathways related to specific interpersonal behaviours (see Supplementary Material). The first pathway examined behaviours associated with avoidance, derived by aggregating scores from the *cold* and *avoidant* subscales. The second pathway examined over-involvement behaviours, aggregated from the *intrusive*, *overly accommodating*, and *self-sacrificing* subscales. While no significant pathways were identified involving the avoidance cluster, intrusive interpersonal styles within the over-involvement cluster partially mediated the relationship between inadequate mentalizing and emotion regulation difficulties (β = 0.04, 95%CI[0.04,0.11],SE = 0.02). Furthermore, a positive association was observed between inadequate mentalizing and epistemic credulity, which influenced over-involvement styles and subsequently contributed to emotion dysregulation (β = 0.03,95%CI[0.02,0.05], SE = 0.01).

None of these alternative pathways showed significant differences between the clinical and community control groups.

4. Discussion

The present study aimed to investigate the associations between mentalizing, epistemic stance (i.e., epistemic trust, mistrust and credulity), interpersonal problems and emotion regulation difficulties. As expected, our results revealed strong positive associations among impairments in mentalizing, higher epistemic mistrust and epistemic credulity, interpersonal problems, and difficulties in emotion regulation. Contrary to our expectations, no significant correlation was observed between epistemic trust and either interpersonal problems or mentalizing abilities. Unexpectedly, we identified a small positive correlation between epistemic trust and emotion regulation difficulties. Supporting our second hypothesis, the results suggested that the relationship between ineffective mentalizing and emotion regulation difficulties was partially and sequentially mediated by epistemic mistrust and interpersonal problems. This mediation pathway was similarly significant for epistemic credulity. However, the mediation involving epistemic trust did not reach significance. Notably, all indirect sequential effects were consistent across both clinical and community control groups.

The current findings corroborate previous research by highlighting a robust relationship between ineffective mentalizing and both epistemic mistrust and credulity (Campbell et al., 2021; Liotti et al., 2023). Our results emphasize the potential role of effective mentalizing as a mechanism for accurately identifying trustworthy sources of information, which is crucial for obtaining reliable insights about social reality (Frith and Frith, 2012; Nolte et al., 2023). The observed association between mentalizing and interpersonal problems adds to the growing body of literature in this area (De Meulemeester et al., 2017; Hayden et al., 2018). Ineffective mentalizing is associated with difficulties in grasping others' intentions and behaviours and misinterpretations of social cues, potentially resulting in interpersonal conflicts and heightened emotional distress (Nolte et al., 2019). Furthermore, our findings corroborate the significant relationship between mentalizing and emotion regulation, supporting previous studies suggesting that proficient mentalizing may enhance the modulation of emotional states by

fostering emotional self-awareness (Schwarzer et al., 2021). Moreover, our findings revealed a strong association between interpersonal difficulties and emotion dysregulation. This supports abundant evidence indicating that deficits in emotion regulation skills are intricately linked with interpersonal challenges, with emotion dysregulation often associated with increased interpersonal sensitivity and ambivalence (Garofalo et al., 2017; Gratz et al., 2013).

Contrary to theoretical expectations that suggest a positive correlation between higher levels of trust and improved mental health outcomes, our research found no significant relationships between epistemic trust and psychological constructs such as mentalizing and interpersonal issues. Similarly, previous studies using community samples have failed to demonstrate significant associations between epistemic trust and mentalizing, while also reporting inconsistent correlations between epistemic trust and various measures of psychopathology (Liotti et al., 2023; Campbell et al., 2021). Although epistemic trust is generally believed to facilitate adaptive social interactions and effective learning—factors that could theoretically enhance emotion regulation—our findings align with those of Asgarizadeh and Ghanbari (2024), who observed a small positive association between epistemic trust and emotion regulation difficulties in one of their community adult samples. However, this association did not persist when clinical and community control groups were analyzed separately, suggesting that the observed correlation might have occurred by chance. Similarly, Parolin et al. (2024) found no significant relationship between epistemic trust and these variables in an adolescent sample. These conflicting results may stem from limitations in the operationalization of epistemic trust within the ETMCQ. As noted in our previous work (Kumpasoglu et al., under review), criticisms of the epistemic trust subscale include its limited incremental validity beyond mistrust and credulity (Asgarizadeh et al., 2023), its inability to differentiate individuals with borderline personality disorder (Asgarizadeh and Ghanbari, 2024), and concerns that some items assess source familiarity rather than source validity (Li et al., 2023). Collectively, these findings highlight substantive conceptual and measurement challenges within the epistemic trust component of the ETMCQ. This underscores the need for further refinement and validation to better capture the complex and nuanced role of epistemic trust in mental health.

Moreover, this study provides the empirical evidence of a link between disruptions in epistemic trust and interpersonal problems, reinforcing theoretical models that posit such deficits can profoundly affect social and interpersonal functioning (Fonagy et al., 2019). Specifically, our results show that individuals with epistemic mistrust might particularly exhibit detachment and coldness in social contexts, may lead to heightened feelings of isolation. Since epistemic mistrust is characterized by perceiving others' actions and motives as with potentially harmful intent, avoidance and cold behaviour might be used as mechanisms to prevent potential harm in relationships. Conversely, those characterized by epistemic credulity might tend towards excessive agreeableness, intrusiveness, dependency, and self-sacrifice within their relationships, making them susceptible to exploitation (Campbell and Allison, 2022). Moreover, socially inhibited and overly nurturing patterns—closely tied to epistemic dysfunction—are commonly observed in individuals with major depressive disorder and anxiety disorders (Pitman and Hilsenroth, 2016). Such behavioral patterns, combined with epistemic dysfunction, may thus function as transdiagnostic factors, complicating the clinical profiles of common mental health disorders. Further, we found a strong positive association between both epistemic mistrust and credulity and difficulties in emotion regulation. Consistent with prior research, disruptions in epistemic trust are associated with a struggle with acquiring and applying effective strategies for emotional regulation, potentially increasing their susceptibility to psychopathological symptoms (Locati et al., 2023; Miu et al., 2022).

In an extension of these initial investigations, we explored the mediating roles of epistemic stance and interpersonal problems in the relationship between mentalizing and difficulties in emotion regulation. Our findings indicate that disruptions in epistemic trust and interpersonal problems may serve as a conduit for the association between mentalizing and emotion regulation. Specifically, a diminished capacity for mentalizing is associated with a state of persistent mistrust and hypervigilance, resulting in a reluctance to update social perceptions with new, potentially beneficial information (Luyten et al., 2020). This reluctance is often compounded by an inability to recognize one's own mental state, which may be associated with feelings of being misunderstood and the adoption of defensive strategies in relationships, such as distancing or reduced supportiveness (Fonagy et al., 2017). These strategies may heighten the risk of social dysfunction and loneliness (Brauner et al., 2023), further impairing the individual's ability to effectively regulate emotions (Eres et al., 2021). Meanwhile, individuals exhibiting epistemic credulity with inadequate mentalizing may find themselves in an uncertain cognitive realm, struggling to determine the reliability of external information and their internal narratives (Fonagy et al., 2019). This uncertainty might hinder their ability to accurately interpret social situations and engage in or select appropriate emotion regulation strategies, thereby exacerbating emotion dysregulation (Parolin et al., 2024).

Interestingly, the relationship between mentalizing and emotion regulation difficulties was not mediated solely by disruptions in epistemic trust when interpersonal problems were excluded from the model. This finding aligns with Locati et al. (2023), who reported distinct and direct relationships between mentalizing, epistemic trust, and emotion dysregulation in their study with adolescents. These results suggest that the combined impact of impaired mentalizing and epistemic mistrust on psychopathology may primarily manifest through disruptions in social communication and relationships. This is consistent with the theoretical perspective that many mental disorders stem from failures in social communication linked to epistemic mistrust (Fonagy and Campbell, 2017). However, it is important to note that these findings do not establish causal relationships between these variables.

Our exploratory analyses of alternative pathways showed that associations between mentalizing and emotion regulation, mediated sequentially through interpersonal problems and epistemic stances, did not reach statistical significance. This suggests that disruptions in epistemic trust may play a pivotal role in the impact of interpersonal difficulties on psychopathology, underscoring the need for more longitudinal research in this domain. Additionally, our analyses revealed no significant pathways involving the cold/avoidant interpersonal cluster, indicating that such interpersonal styles may not contribute significantly to the mediation process between mentalizing deficits and emotion regulation difficulties. In contrast, significant mediation effects within the over-involvement cluster underscore the critical role of intrusive interpersonal styles. These styles appear to link mentalizing deficits to emotion regulation challenges, both directly and indirectly, through epistemic credulity. These findings also align with Coyne's interpersonal theory of depression, which suggests that individuals with depression often engage in interpersonal feedback-seeking behaviours, such as excessive reassurance-seeking, which can become burdensome for others and may elicit withdrawal or criticism (Coyne, 1976; Hames et al., 2013). Epistemic credulity may similarly heighten the need for external validation, especially among individuals with depression or anxiety, which could, in turn, lead to intensified experiences of social rejection.

Notably, our findings indicate that these mechanisms by which mentalizing influences emotion regulation—whether indirectly through pathways involving epistemic mistrust, credulity, and interpersonal problems—are relevant across both control and clinical contexts. This robustness suggests that our model's relevance is not limited to those with psychopathological conditions but also applies broadly to non-clinical populations. Regarding the other indirect effects, we observed that in the control group, epistemic credulity mediates the relationship between mentalizing and emotion regulation difficulties, whereas this mediation is not statistically significant in the clinical group. We

speculate that the clinical group may experience an epistemic dilemma, wherein individuals simultaneously experience both profound mistrust and credulity (Campbell and Fonagy, 2022). In cases of heightened epistemic disruption, the predominant presence of mistrust, coupled with inadequate mentalizing, may overshadow any the potential detrimental effects of credulity on emotion regulation. Additionally, our findings also revealed a direct association between mentalizing and difficulties in emotion regulation, even after accounting for the mediation effects, suggesting that adequate mentalizing may be a crucial factor for efficient emotion regulation (Euler et al., 2021; Locati et al., 2023).

4.1. Study limitations

Several limitations warrant caution in interpreting this study's results. We followed a theoretical model suggesting that ineffective mentalizing leads to disruptions in epistemic trust, contributing to interpersonal problems, and subsequently impacting emotion regulation. However, current mentalizing theory suggests a more complex and cyclical understanding of the underlying psychopathological mechanisms, where each system loosely interacts with others (Fonagy et al., 2017). For example, difficulties in mentalizing, which may be influenced by early childhood adversities, can contribute to emotional dysregulation. This dysregulation may, in turn, exacerbate mentalizing challenges by intensifying emotional states, creating a cyclical pattern of psychological distress (Fonagy et al., 2017). Similarly, impairments in epistemic trust can provoke heightened negative emotions. When coupled with inadequate emotional regulation skills, these heightened emotions may further complicate social interactions and perpetuate challenges in both interpersonal relationships and overall mental health. Hence, this study only examined a fraction of this complex network of relationships. Future research should aim to unravel additional interactions within these mechanisms and their clinical implications.

Additionally, the cross-sectional design of our study hinders establishing causal conclusions. Although we discussed the possibility of confirming causal interpretations based on theoretical assumptions, future studies using prospective or longitudinal designs are necessary to validate these initial findings. The use of self-report assessments in our study also introduces potential biases (Bauhoff, 2014). In evaluating mentalizing and epistemic trust capacities, there may be discrepancies between respondents' self-evaluations and their actual abilities (Schwarzer et al., 2021; Taubner and Sevecke, 2015), as well as overlap between constructs.

Lastly, limitations pertain to the specific sample examined. Control participants were mainly recruited from an online survey website, and clinical participants were individuals seeking treatment from the NHS Talking Therapies programme. Both recruitment methods might limit the study's generalizability. Future research should replicate these findings using alternative assessment methods, such as behavioral tests and interviews, and with more diverse samples.

4.2. Implications for clinical practice and research

Our findings suggest potential insights for clinical practice, particularly in understanding underlying factors that may contribute to emotion regulation difficulties and enhancing related treatment modalities. While existing research and the principles of mentalization-based treatments (MBT) underscore the significance of mentalizing within therapeutic contexts (Bales et al., 2012; Bateman and Fonagy, 2010), our observations tentatively propose that fostering epistemic trust may serve as a beneficial focal point for interventions designed to enhance emotion regulation, especially in the presence of interpersonal problems. The therapist's authentic endeavour to comprehend the patient's internal experiences might lessen the patient's epistemic vigilance (Schroder-Pfeifer et al., 2018), potentially paving the way for patients to embrace relational knowledge within psychotherapy. This, in turn, might facilitate the adoption of more effective emotion regulation techniques. Additionally, our preliminary findings hint at the role of interpersonal dynamics, which could manifest in therapy through elements like the therapeutic alliance. Future research might explore how the therapeutic alliance influences the interplay between epistemic trust and psychotherapy outcomes, as well as the external manifestations of these dynamics (Nolte et al., 2023).

In conclusion, our results hint at the potential benefits of incorporating communication-focused approaches in psychotherapy, particularly in addressing clinical presentations linked to difficulties in affect regulation. This opens a promising avenue for future research and therapeutic interventions, potentially enhancing their effectiveness and providing more comprehensive care for those struggling with psychopathological conditions. While further research is needed to overcome the limitations and validate the findings of the present study, this research marks an important step in highlighting the complex interplay of mentalizing, epistemic stance, interpersonal problems, and emotion regulation in psychological functioning. Ultimately, it provides a preliminary pathway towards a deeper understanding of the social-communicative roots of mental health.

CRediT authorship contribution statement

Güler Beril Kumpasoğlu: Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Rob Saunders:** Writing – review & editing, Supervision, Methodology, Formal analysis. **Chloe Campbell:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Tobias Nolte:** Writing – review & editing, Project administration, Data curation, Conceptualization. **Read Montague:** Project administration, Investigation, Funding acquisition, Data curation. **Steve Pilling:** Writing – review & editing, Project administration, Investigation, Data curation. **Judy Leibowitz:** Writing – review & editing, Investigation, Data curation. **Peter Fonagy:** Writing – review & editing, Supervision, Methodology, Investigation, Conceptualization.

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Declaration of competing interest

The authors declare that there were no conflicts of interest with respect to the authorship or the publication of this article.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2024.12.050.

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