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Mentalization within close relationships: The role of specific attachment style

Abstract: *Mentalization is a form of social cognition that enables to perceive and interpret human behaviour in terms of intentional mental states (Frith & Frith, 2003) and is influenced by social context (e.g., O'Connor and Hirsch, 1999). Hence, we examined mentalization related to specific attachment relationships (Bowlby, 1969; Fraley, 2007). This study involved 115 participants (85% female) who reported their relationship-specific (ECR-RS; Fraley et al., 2011) and global attachment styles (ECR; Brennan, Clark, Shaver, 1998), and perspective-taking tendency towards their attachment figures (IRI-PT subscale; Davis, 1983). Reading the Mind in the Eyes Task-Revised (Baron-Cohen et al., 2001) was used as a proxy for mentalization disregarding relationships. The results showed that perspective-taking was associated with relationship-specific attachment avoidance ($r_s > -.29$; all $p_s < .01$) whereas global characteristics of mentalization were not related to attachment quality. Our findings indicate that the link between attachment quality and mentalization is relationship-specific.*

Key words: *mentalization, perspective-taking, relationship-specific attachment style, global attachment style*

Introduction

Individuals need to infer cognitive and affective states of others to successfully navigate in social world. Several research traditions with a corresponding variety of concepts such as theory of mind (ToM), social cognition, social understanding, perspective taking, and empathy, try to encompass the social cognitive processes involved in perceiving, feeling, and inferring cognitive and/or affective states of others (Fonagy, Bateman, & Luyten, 2011; Frith & Frith, 2003; Walter, 2012). Yet, recently these diverse research traditions and their research foci more broadly have been conceptualized as the capacity to mentalize (Choi-Kain & Gunderson, 2008; Fonagy, Gergely, Jurist, & Target, 2002). Mentalization is a form of social cognition that enables humans to attribute beliefs, desires, feelings, needs, and motives to others (Allen, Fonagy, & Bateman, 2008; Bateman & Fonagy, 2006; Fonagy & Luyten, 2009). As such, it is an imaginative mental activity by which we implicitly and explicitly interpret the actions of ourselves and others as meaningful based on intentional mental states (Fonagy et al., 2002; Fonagy & Luyten, 2009).

The understanding of intentional mental states of others that underpin their behaviours is crucial for smooth social interactions and constitutes a core component of social

competence in childhood (Bosacki & Wilde Astington, 1999; Fonagy & Target, 1997) and adulthood (Allen et al., 2008). Neuroimaging studies on social cognition revealed a multidimensional structure of mentalization and showed that disturbances in one dimension of mentalization may not necessarily affect others (Fonagy & Luyten, 2009). Based on these findings, Fonagy and Luyten (2009) proposed that mentalization is underpinned by four functional polarities: (1) automatic – controlled, (2) internally-focused – externally-focused, (3) self-oriented – other-oriented, (4) cognitive – affective. The four polarities provide a comprehensive matrix for the conceptualization of various aspects of mentalization as well as define the relationship between mentalization and closely related constructs such as theory of mind or empathy.

Evidence from behavioural, physiological, neurobiological, and neuroimaging studies suggests that stress or arousal facilitates automatic mentalization, while inhibiting the neural systems associated with controlled mentalization (Lieberman, 2007; Mayes, 2006). Controlled mentalizing reflects a serial and relatively slow process, which is typically verbal and requires reflection and other effortful processes (Fonagy & Luyten, 2009). Automatic or implicit mentalization, in contrast, involves parallel and therefore much faster processing; is typically reflexive and

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effortless (Satpute & Lieberman, 2006). When individuals become emotionally aroused, automatic mentalization predominates and stipulates the use of more schematic and even biased forms of cognitive processing which likely occur within the context of close attachment relationships. Evidence from neuroimaging studies suggest that activation of attachment system leads simultaneously to relative deactivation of brain circuits related to mentalization (Fonagy et al., 2011; Fonagy & Luyten, 2009). Essentially, Bartels and Zeki (2000; 2004) reported that the activation of areas mediating maternal and/or romantic attachments appeared simultaneously to suppress brain activity in several regions mediating different aspects of cognitive control and including those associated with making social judgments and mentalizing. In this context, recent study (Nolte et al., 2013) has shown that after attachment-related stress exposure activation in the neuronal circuits associated with the ability to infer about others' mental states were significantly reduced compared to condition with general stress induction.

Effective and full mentalization entails integration of cognition and affect (Fonagy et al., 2011; Fonagy et al., 2002). Hence, we can see mentalization on the dimension from belief-desire reasoning to empathy, i.e. sharing and feeling the affective state of the other that is usually considered as an affective reaction to the affective state of someone else (Singer & Lamm, 2009). Walter (2012), for instance, proposed to equate cognitive empathy with affective theory of mind (ToM), that is, with mentalizing the emotions of others whereas affective empathy to define as sharing emotions with others. Cognitive ToM, on the other hand, has been equated with mentalizing about cognitive states. As a result, mentalization may entail the overlap between ToM and empathy, especially when researchers have distinguished two forms of empathy and related both ones to ToM. Later in this work we used perspective taking as a proxy for both cognitive and affective aspects of mentalization because perspective taking is an essential component of mentalization that entails the overlap between ToM and empathy (Fonagy & Luyten, 2009; Luyten, Fonagy, Lowyck, & Vermote, 2011). Perspective taking has its relational specificity, such that individuals might tend to take the perspective of one person but being reserved towards the other one which makes perspective taking particularly suitable for investigating mentalization in different relational contexts.

Internally-focused mentalization refers to mental processes that focus on thoughts, feelings, experiences that have to be inferred rather than literally observed. Externally-focused mentalization, on the other hand, relies on physical and visible features and/or actions. Some individuals may struggle with "reading the mind" of others based on internal features (e.g., desires) while being hypersensitive to emotional expressions in faces or bodily postures. In the context of research, externally-focused mentalization is typically measured by tasks involving, for instance, facial emotion recognition whereas self-report instruments tend to employ more internally-oriented type of mentalization (Luyten et al., 2011).

With respect to the object of mentalization, i.e., the self or others, neuroimaging studies identified a set of brain regions constituting functional networks that represent either one's own or another's mental interior. Internally-focused processes are represented by medial frontoparietal network whereas externally-focused processes are represented by lateral fronto-parietal-temporal networks (Lieberman, 2007). Findings that two different neural systems are involved in mentalization with regard to self and others suggest that these functional polarities are to some extent independent, and as a consequence their deficits are not mutually exclusive. Thus, researchers start to draw their attention to factors that temporarily inhibit or foster mentalization (state aspect) in addition to traditional focus on pervasive deficits in mentalization (trait aspect).

Initial findings contradict the implicit assumptions that contextual variation in mentalizing across different settings is minimal (Luyten et al., 2011). Mentalization is gradual with large individual differences and a variety of social factors affect its quality. In fact, mentalization is contextualised within relationships and thus varies across different interpersonal contexts. O'Connor and Hirsch (1999), for example, found that young adolescents had lower levels of mentalization and more distorted mentalization with regard to least liked teachers as compared to most liked teachers which was assessed using semi-structured interview with respect to situations derived from common school experiences. Evidence from psychotherapy research shows considerable fluctuations of mentalization within and between psychotherapy sessions and in a relationship to the therapist (e.g., Diamond & Yeomans, 2008; for a review, see Luyten et al., 2011). During psychotherapy the quality of mentalization in patient-therapist dyads was bidirectional, such that the level of mentalization was partly determined by therapist and vice versa (Diamond et al., 2003). Hence, the extent to which individuals effectively mentalize partly depends on the interaction partner's ability to mentalize. On the other hand, Brown, Donelan-McCall, and Dunn (1996) found that there was little within-individual correlation in young children's mental state talk with mothers, siblings and friends. However, their findings are unclear whether the type of relationship (e.g., mother compared to sibling) or relationship quality explains this effect. Additionally, mentalization may vary due to the type of interaction we are in and what the aim of this interaction is (e.g., competition vs. cooperation) (Liotti & Gilbert, 2011). Likewise, supportive relationship facilitates mentalization whereas a conflicted relationship inhibits it (Fonagy & Luyten, 2009; O'Connor & Hirsch, 1999).

The aforementioned research suggests that social context influences mentalization and the quality of relationships may play a significant role in this interplay. Children naturally start understanding the actions of people physically closest to them. Most likely these people are attachment figures who employ specific strategies towards parenting. Developmental studies revealed that quality of parenting appears to facilitate the establishment of robust mentalization (e.g., Meins, Fernyhough, Fradley, & Tuckey, 2001). Parental use of internal state language

predicts children's subsequent ability to understand the false beliefs tasks and the quality of attachment underlies these associations (Dunn, 1996; Fonagy et al., 2002; Fonagy & Target, 1997) since children with secure attachment histories acquire mentalization somewhat earlier (Fonagy & Target, 1997; Meins et al., 2002). Fonagy et al. (2011) propose that it is possible that attachment strategies adopted by children may indicate the quality of attention shown by the caregiver in their mental states. We might then predict that mentalization is partly dependent on attachment strategies encapsulated in attachment style. Specifically, hyperactivating strategies observed in the context of anxiety attachment characterized by frantic attempts to gain the attention of the attachment figure (Mikulincer & Shaver, 2007) leads to heightened vigilance for threat and relative deactivation of brain areas involved in reflective social cognition (Nolte, Guiney, Fonagy, Mayes, & Luyten, 2011). Anxiety attachment may particularly be related to hypersensitivity of social cues and cognitive appraisal in terms of fear or anger (C. R. Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006). On the other hand, deactivating strategies that are typical for avoidant attachment style are characterized by attempts to suppress attachment system and attachment needs. Deactivating strategies are observable in self-soothing activities, assertions of independence (Mikulincer & Shaver, 2007) and avoidant individuals seem to considerably lower the brain's responsiveness to social emotional information and show low activity in brain areas that usually process reward and prosocial motivation (Vrticka & Vuilleumier, 2012). As a result, avoidant individuals may represent average mentalizing capacity but tend to employ mentalizing strategies scantily. From this standpoint, secure attachment is most likely related to optimal and flexible mentalization because securely attached individuals tend to process social information in an unbiased and more reflective way (Fonagy & Luyten, 2009).

Second line of research shows that the fluent ability to mentalize on the parent's attachment history predicts security of attachment in the child (Fonagy, 1991; Slade, Grienberger, Bernbach, Levy, & Locker, 2005). Hence, mentalization has its roots partly in an intimate caregiver-infant relationship and, to some degree, overlaps in time with the development of attachment system (e.g., Fonagy et al., 2002; Fonagy, Steel, Steel, & Holder, 1997; Meins et al., 2001). Therefore, interpersonal understanding is particularly influenced by attachment context and attachment security enhances mentalization in terms of increased interest in intentions of others (motivational aspect) and increased accuracy of "reading" others' thoughts and feelings (cognitive aspect) (e.g., Humfress, O'Connor, Slaughter, Target, & Fonagy, 2002; Hunefeldt, Laghi, Ortu, & Belardinelli, 2013; Meins et al., 2001). Research on maltreatment support the role of secure attachment in the development and the usage of mentalization. Maltreated children engage in less symbolic and dyadic play (Alessandri, 1991) and present delayed theory of mind understanding (Cicchetti, Rogosch, Maughan, Toth, & Bruce, 2003). Research in adults is scarcer in this regard, nevertheless, demonstrates the postulated association between mentalization and attachment quality. Mikulincer

et al. (2001) run a series of studies in which, subjects were contextually primed with attachment-related material and subsequently asked to report empathy-related feelings and personal distress or the accessibility of empathy and personal-distress memories. Results indicated that self-report attachment-related avoidance was inversely related to empathy whereas attachment-related anxiety was positively related to personal distress.

However, in most studies researchers have typically used neutral figures and non-personal settings in experimental tasks testing the capacity to mentalize. Moreover, they mostly examined general characteristics of mentalization disregarding social context. Attachment experience is a predictive factor of mentalization, however, research typically overlooks the findings that people possess multiple attachment relationships (e.g., R. C. Fraley, 2007). It is presumed that attachment style is general and stable across relationships. Accordingly, attachment style is often measured broadly with respect to relationships in general without a particular focus on a specific relationship (Collins & Read, 1994). This common practice has been recently criticized (R. C. Fraley, Heffernan, Vicary, & Brumbaugh, 2011; Nofle & Gillath, 2009). Thus, the observable contextual fluctuations of mentalization may be explained by specific attachment relationships because relationship-specific attachment may vary in its quality, i.e., on the level of attachment-related anxiety and avoidance across attachment figures (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Collins & Read, 1994; R. C. Fraley et al., 2011). For example, a person may consider his or her romantic partner to be warm, affectionate, and responsive, yet, because of a different relational history, simultaneously may view his or her mother as being totally different in terms of meeting his or her affiliation needs. As a result, different attachment experience may be reflected in the relationship-specific mentalization.

In this context, researchers suggest that to some extent there is an intra-individual variability in attachment style across attachment figures (Baldwin et al., 1996; Pietromonaco & Feldman, 2000; Trinke & Bartholomew, 1997). Therefore, they started to refer to a relationship-specific attachment style which reflects the typical behaviour, thoughts, and feelings of individuals toward their specific attachment figures, whereas global attachment style is an aggregated representation of different attachment relationships (Collins & Read, 1994). Keeping the notion that there is considerable within-person variability in the expectations and beliefs that individuals hold about significant others in their lives, global and specific attachment styles are probably related, but they are not likely to be identical (cf., Cozzarelli, Hoekstra, & Bylsma, 2000; Klohnen, Weller, Luo, & Choe, 2005). The distinction between global and specific attachment style gives us a unique opportunity to investigate the role of relationship-specific context in mentalization. Moreover, most studies investigating the link between mentalization and relationships are restricted to early childhood, making it unclear whether specific attachment is related to mentalization in adulthood.

The present research

In the current study, we investigated mentalization as a relationship-specific ability reflected in perspective taking, i.e. the tendency to engage in understanding others' mental states. We used perspective taking as a proxy for controlled, internally-focused, other-oriented type of mentalization that entails both its cognitive and affective facets (Luyten et al., 2011). Perspective taking has its relational specificity which enabled us to investigate perspective taking within the relationships with mother, father, romantic partner, and best friend. We chose these people as objects of mentalization because they most likely serve attachment functions (R. C. Fraley & Davis, 1997; Trinke & Bartholomew, 1997). Additionally, previous studies showed that there is considerable variation in attachment quality among these relational domains. Given that and the postulated association between attachment quality and mentalization, we were able to look at systematic variation in relationship-specific perspective taking along with the changes in relationship specific attachment quality. This type of analytical strategy posits that we focused on the quality of attachment as a factor significantly related to perspective taking. We neglected the role of the type of relationship because we presumed that if there are any differences in perspective taking with respect to different attachment figures, they are driven by the underlying attachment quality.

Attachment theory postulates specific individual differences in social functioning related to the quality of attachment which enabled us to formulate some predictions with respect to the direction of the possible associations between specific attachment and perspective taking within particular attachment relationships. We expected that attachment-related avoidance would decrease the motivation for engaging in reading mental states of the other due to its defensively-oriented attachment function, i.e., denying attachment needs and asserting one's own autonomy (Mikulincer & Shaver, 2007). Thus, relationship-specific attachment avoidance will be related to decreased tendency to take the perspective of the respective attachment figure. We did not have any specific predictions with respect to attachment anxiety. Research suggests hypersensitivity to mental states in anxious individuals but these results were mainly obtained in an experimental setting, not by self-report instruments (e.g., C. R. Fraley et al., 2006).

Further, we examined whether global attachment style expressed in a form of aggregated representation of close relationships is related to relationship-specific perspective taking and mentalization outside relational context measured by an intentional state recognition task, i.e., Reading the mind in the eyes task (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) which taps a controlled, other-focused, external-based type of mentalization comprising both its cognitive and affective facets (Luyten et al., 2011). This task has been widely used in research on social cognition combining its cognitive and affective facets in clinical as well as normal populations, and is sufficiently sensible to detect individual differences in many different research contexts (for a review, see Adams et

al., 2009; Johnston, Miles, & McKinlay, 2008), for example concerning age (e.g., Pardini & Nichelli, 2009). As such, this task allowed us to investigate whether the ability to mentalize based on external features (e.g., facial emotional expressions) is related to global attachment style. We expected to observe negative associations between global attachment-related avoidance and anxiety with respect to the accuracy at the task (c.f., Hunefeldt et al., 2013).

Given our main interest in the role of relationship-specific attachment in mentalization, we finally tested whether relationship-specific attachment predicts perspective taking embedded in relational context over and above global attachment style.

Method

Participants

This study involved 115 (85% female) students of Adam Mickiewicz University of Poznan in Poland ranging in age from 19 to 42 years ($M = 21.13$, $SD = 3.48$). All participants gave their informed consent for participation in this study.

Measures

Perspective taking within specific attachment relationships

The relationship-specific disposition (tendency) for perspective taking was measured with the Interpersonal Reactivity Index-Perspective Taking Subscale (PT; Davis, 1983; Lewicka, 2010). The subscale consists of 7 items that assess the tendency to spontaneously adopt the psychological point of view of others (e.g., "I sometimes find it difficult to see things from the "other guy's" point of view") and address the emotional and cognitive polarity of empathy. In this study, participants were instructed to indicate to which extent they take the perspective of their mother, father, romantic partner, and best friend (e.g. "I sometimes find it difficult to see things from my mother's point of view"). The internal consistency was high for each attachment relationship with Cronbach's $\alpha = .79$, $.85$, $.77$, and $.73$, respectively. The global perspective taking regardless of relational context was expressed by the average score of perspective taking across all relational domains.

Intentional mental state recognition task – mentalization outside relational context

We used a common intentional state recognition task, namely the Reading the Mind in the Eyes Test-Revised (RMET-R; Baron-Cohen et al., 2001; Franus & Jankowiak-Siuda, 2009) to capture more general characteristics of mentalization regardless any relational context. The task consists of 36 black-and-white photographs of the eye region of faces edited from just above the eyebrows to halfway down the bridge of the nose. Participants were instructed to select one of four mental state adjectives (the standardized correct adjective and three distracters; e.g. "hateful", "jealous", "arrogant", "panicked") that best depict the mental state shown in the eyes. The number of correct responses on the task indicated the general capability of mentalization. In the current study Cronbach's alpha was .44.

Specific attachment style

Specific attachment styles across different relationships were measured with the Experiences in Close Relationships-Relationship Structures Scale (ECR-RS; R. C. Fraley et al., 2011). It is a self-report instrument designed to assess relationship-specific attachment in four close relationships – the same 9 items are used to assess the attachment-related anxiety (e.g. “I often worry that this person doesn’t really care for me”) and avoidance (e.g. “It helps to turn to this person in times of need”) with respect to four attachment figures (i.e., mother, father, romantic partner, and best friend).

The current version was designed by selecting the corresponding 4 items from the existing Polish version of the ECR (Rajewska-Rynkowska, 2007). Rest 5 items were translated by independent translators and then the final version was agreed. In the current study, the Cronbach’s alpha reliability estimates of the scores showed high internal consistency and were very close to those obtained in the original study (R. C. Fraley et al., 2011), i.e., the lowest alpha was .83.

In order to determine whether the Polish version of ECR-RS had a two-factor structure as the original scale, we run an exploratory factor analysis. We used principal axis factoring, followed by Oblimin rotation and Kaiser correction separately for the 9 attachment items for each of the four relational domains of ECR-RS. The Kaiser-Meyer-Olkin measure of sampling adequacy was greater than .79.

Table 1 shows the factor loadings for the items in each domain, using a two-factor solution, and reliability values. Items 5 and 6 were reversed as suggested by the authors (R. C. Fraley et al., 2011). In each domain, there were clear avoidance and anxiety factors.

Global attachment style

Global attachment style was measured with the Polish version of Experiences in Close Relationships Scale (ECR; Brennan, Clark, & Shaver, 1998; Rajewska-

Rynkowska, 2007). It is a 36-item self-report measure that consists of two subscales: attachment-related anxiety (e.g. “I worry about being abandoned”) and avoidance (e.g. “I don’t feel comfortable opening up to close others”). Each subscale comprises 18 items. We aimed to create relationship-general scores, thus participants were instructed to rate the relationship-related statements with respect to how they think, feel, and behave towards important people in their lives in general (close others), leaving the target purposely vague. The internal consistency was high for each subscale with Cronbach’s $\alpha = .90$ for attachment avoidance and Cronbach’s $\alpha = .91$ for attachment anxiety.

Procedure

The same questionnaire packet was administered to the several groups of students in the classroom during a regular class period and took approximately 40 min to complete. Instructions stated that the questionnaires were voluntary and that responses were anonymous and confidential. The questionnaires were always presented in the same order. Specifically, the items of relational domains of the ECR-RS always followed the same sequence with respect to mother, father, romantic partner, and best friend in line with the original procedure (R. C. Fraley et al., 2011).

Results**Descriptive statistics**

The group means, standard deviations, and skewness for scores of the Experiences in Close Relationships Scale (ECR), Experiences in Close Relationships-Relationship Structures Scale (ECR-RS), perspective taking (PT) and the Reading the mind in the eyes task revised (RMET-R) are reported in Table 2. With respect to results of both global and specific attachment styles, the scores for avoidance and anxiety were relatively lower than those reported by R. C. Fraley et al. (2011) and skewness was accordingly somewhat higher, which reflects a higher density of scores on low end

Table 1. Factor loadings for items of Experiences in Close Relationships-Relationship Structures (ECR-RS).

Item	Mother		Father		Romantic partner		Best friend	
	Avoidance	Anxiety	Avoidance	Anxiety	Avoidance	Anxiety	Avoidance	Anxiety
1	.89	-.54	.84	-.48	.81	-.41	.85	-.49
2	.82	-.52	.80	-.47	.67	-.18	.82	-.51
3	.91	-.57	.88	-.52	.83	-.39	.82	-.39
4	.87	-.60	.88	-.61	.80	-.62	.83	-.48
5*	.70	-.32	.79	-.53	.69	-.42	.60	-.46
6*	.79	-.34	.81	-.47	.72	-.44	.76	-.52
7	-.49	.88	-.49	.83	-.45	.90	-.49	.84
8	-.36	.84	-.41	.87	-.37	.88	-.49	.89
9	-.54	.90	-.64	.89	-.45	.89	-.46	.82
Reliability	.91	.87	.92	.84	.85	.90	.87	.83
Explained variance	74.40%		73.40%		67.66%		67.95%	

Note: * reversed items.

of anxiety and avoidance dimensions in each relational domain. The results are comparable with those reported by Hunefeldt et al. (2013). We performed paired t-tests with Bonferroni correction at the level of significance of $p = .01$ to test whether scores on ECR-RS anxiety and avoidance dimensions differ between relational domains. With respect to avoidance dimension, all scores within relational domains differ significantly, except for the comparison between romantic partner and best friend domains. The score of attachment-related avoidance to father was the highest among all domains ($M = 3.88$; $SD = 1.60$). With respect to the anxiety dimension, the domains of mother and father as well as the domains of father and best friend did not differ significantly. The score of attachment-related anxiety to romantic partner was the highest among all domains ($M = 3.86$; $SD = 1.84$).

PT scores indicate that participants tended to report that in general they take the mental perspective of their attachment figures. The negative skewness across all attachment figures reflects that the density of scores was higher for scores above than for scores below the mean score. Table 3 report intercorrelations among all domains with respect to perspective taking. Perspective taking domains were rather modestly correlated within each other. The strongest correlations were observed between mother and father ($r = .58$; $p < .01$), mother and best friend ($r =$

$.60$; $p < .01$), and between romantic partner and best friend ($r = .51$; $p < .01$). Additionally, we performed paired t-tests with Bonferroni correction at the level of significance of $p = .01$, in analogy to the analyses reported above with respect to ECR-RS scores. All relationship-specific PT scores differ significantly, except for the comparison between romantic partner and best friend domains. Subjects reported to take mostly the perspective of their romantic partner ($M = 2.66$; $SD = .53$) and best friend ($M = 2.75$; $SD = .46$).

The mean score on RMET-R indicates that in general participants perform relatively well on ToM task. The negative skewness indicates that the density of ToM scores was higher for scores above than for scores below the mean score.

Effects of gender and age on the accuracy of mentalization (RMET-R)

We divided participants into two groups regarding their age based on the III ($n = 87$, 19 – 21 years) vs IV quartiles ($n = 28$, 22 – 42 years). A one-way ANOVA with gender and age as between-group factors on participants' RMET-R scores (number of correct responses) revealed no main effect of gender $F(1,109) = .01$, $p > .94$ and age $F(1,109) = 1.79$, $p > .18$, nor effect of interaction between gender and age $F(1,109) = .08$, $p > .78$.

Table 2. Minimum and maximum values, means, standard deviations, and skewness for the Experiences in Close Relationships (ECR), Experiences in Close Relationships-Relationship Structures (ECR-RS), Perspective Taking, and the Reading the Mind in the Eyes Test-Revised (RMET-R).

Variable	Min	Max	<i>M</i>	<i>SD</i>	Skewness
ECR					
anxiety	1.89	7.00	4.36	1.04	-.01
avoidance	1.17	5.17	3.08	.92	.16
ECR-RS					
anxiety with mother	1.00	7.00	2.25	1.60	1.38
avoidance with mother	1.00	6.67	2.95	1.48	.59
anxiety with father	1.00	7.00	2.39	1.56	1.07
avoidance with father	1.00	7.00	3.88	1.60	.23
anxiety with romantic partner	1.00	7.00	3.86	1.84	-.07
avoidance with romantic partner	1.00	6.00	2.31	1.05	1.28
anxiety with best friend	1.00	6.00	2.62	1.28	.59
avoidance with best friend	1.00	5.50	2.30	1.01	.94
Perspective Taking					
mother	0.00	4.00	2.33	.81	-.25
father	0.00	4.00	2.09	.93	-.09
romantic partner	0.00	4.00	2.66	.53	-.71
best friend	1.14	4.00	2.75	.46	-.26
RMET-R	17.00	34.00	25.95	3.38	-.36

Note: The ECR and ECR-RS scores are on a seven-point Likert-scale (1-7). The Perspective Taking score is on a five-point Likert-scale (0-4). The RMET-R score refers to the number of correct responses (0-36).

Table 3. Inter correlations among perspective taking domains.

Perspective Taking	Mother	Father	Partner	Friend
Mother	<i>.79</i>			
Father	<i>.58**</i>	<i>.85</i>		
Partner	<i>.37**</i>	<i>.19</i>	<i>.77</i>	
Friend	<i>.60**</i>	<i>.27**</i>	<i>.51**</i>	<i>.73</i>

Note: Cronbach's alphas are on the diagonal in italics. ** $p < .01$

Table 4. Correlations between specific attachment styles measured with Experiences in Close Relationships-Relationship Structures (ECR-RS) and global attachment style measured with Experiences in Close Relationships (ECR).

Variable	Anxiety				Avoidance				Global	
	Mother	Father	Partner	Friend	Mother	Father	Partner	Friend	Anxiety	Avoidance
Anxiety										
Mother	<i>.87</i>									
Father	<i>.42**</i>	<i>.84</i>								
Partner	—	—	<i>.90</i>							
Friend	<i>.37**</i>	<i>.32**</i>	<i>.36**</i>	<i>.83</i>						
Avoidance										
Mother	<i>.39**</i>	—	—	—	<i>.91</i>					
Father	<i>.23**</i>	<i>.48**</i>	—	—	<i>.37**</i>	<i>.92</i>				
Partner	—	—	<i>.37**</i>	<i>.03</i>	<i>.22*</i>	—	<i>.85</i>			
Friend	—	—	—	<i>.41**</i>	—	—	—	<i>.87</i>		
Global										
Anxiety	<i>.19*</i>	<i>.19**</i>	<i>.51**</i>	<i>.39**</i>	—	—	<i>.19*</i>	—	<i>.90</i>	
Avoidance	—	—	—	—	<i>.19†</i>	—	<i>.50**</i>	<i>.19†</i>	—	<i>.91</i>

Note: Cronbach's alphas are on the diagonal in italics. † $p < .06$; * $p < .05$; ** $p < .01$

Global and specific attachment style

The intercorrelations among the various ECR-RS scores and the correlations between the ECR attachment dimensions and the ECR-RS dimensions are reported in Table 4. The ECR dimensions and the ECR-RS dimensions were positively but weakly correlated. The two measures tended to be most strongly correlated in the romantic domain. ECR anxiety correlated with RS-romantic anxiety ($r = .51$); ECR avoidance correlated with RS-romantic avoidance ($r = .50$). There is also relatively strong correlation between ECR anxiety and RS-anxiety dimension in the relationship with best friend ($r = .39$). Thus, we tested whether there is a significant difference between these two correlations in regard to both specific domains and global score on anxiety dimension. Hotelling-Williams (Steiger, 1980) test showed that specific attachment style within romantic domain was not correlated stronger to ECR-anxiety than specific style to the best friend, $t(109) = 1.32$; $p = .19$. However, taking into account the scores on avoidance dimension, it is reasonable to say that scores in the romantic domain are mostly correlated with global attachment style.

Furthermore, attachment styles to both parents were moderately correlated with each other; $r = .42$ for anxiety and $r = .37$ for avoidance dimension, respectively.

Last but not least, ECR anxiety and avoidance dimensions were not correlated in our study ($p > .2$). However, we observed correlations between ECR-RS dimensions in each attachment relationship. Overall, these results parallel the results reported by R. C. Fraley et al. (2011).

Attachment style and mentalization

We next examined the association between these two measures of attachment and both measures of mentalization, namely perspective taking within specific relationships (PT) and task involving recognition of intentional mental states based on external features (RMET-R) as a proxy for general mentalization disregarding relationships.

Table 5 reports these correlations. In general, the relationship-specific disposition for perspective taking was inversely correlated with ECR-RS avoidance dimension in all relationships ($r_s < -.29$; $p_s < .01$). We observed good correspondence between relationship specific perspective taking and attachment figure which indicates that perspective taking is embedded within specific attachment relationships. However, some inconsistencies between domains were also found, indicating that the instruments we used were not able to perfectly distinguish among relational domains. We found

Table 5. Correlations between attachment style and mentalization reflected in perspective taking and reading the mind in the eyes task.

Variable	Specific Attachment								Global Attachment	
	Anxiety				Avoidance				Anxiety	Avoidance
	Mother	Father	Partner	Friend	Mother	Father	Partner	Friend		
Perspective taking (PT)										
Mother	—	—	—	—	-.30**	—	—	-.21*	—	—
Father	—	-.31**	—	—	—	-.44**	—	—	—	—
Partner	—	—	—	—	—	—	-.29**	—	—	—
Friend	—	—	.19*	—	—	—	—	-.51**	—	—
Average PT	—	-.22*	—	—	—	-.22*	-.24*	-.30**	-.19†	—
Reading the mind in the eyes task	—	—	—	—	—	—	—	—	—	—

Note: Perspective taking across all 4 relationships is reflected in average PT scores. † $p < .06$; * $p < .05$; ** $p < .01$

Table 6. Correlations between global attachment style expressed by the average score of ECR-RS and relationship-specific perspective taking.

Perspective taking (PT)	Average ECR-RS	
	Anxiety	Avoidance
Mother	—	-.29**
Father	—	-.31**
Partner	—	—
Friend	—	-.23*
Average PT	—	-.32**
Average ECR-RS avoidance	.39**	

Note: Perspective taking across all 4 relationships is reflected in average PT scores. * $p < .05$; ** $p < .01$

inconsistency between perspective taking within a specific relationship and specific attachment to that particular person in two cases: a) mother and best friend on avoidance dimension ($r = -.21$), b) friend and romantic partner on anxiety dimension ($r = .19$). Correlations were related to attachment-related avoidance as we expected. However, we also found significant results on anxiety dimension. Specific attachment to father was negatively related to perspective taking within this relationship ($r = -.31$).

There were no associations between perspective taking within relational context and scores on ECR in line with our assumptions (all $ps > .06$). However, a trend toward significance ($p < .07$) has been reported between perspective taking within a relation to father as well as to romantic partner and ECR anxiety dimension. As for general ability for perspective taking regardless of relational

context, we observed a negative correlation between global perspective taking variable (G-PT) and ECR scores on anxiety dimension ($r = -.19$, $p = .05$). We did not find any similar associations on avoidance dimension. Given the fact that ECR scores were relatively strongly correlated with the romantic domain of ECR-RS ($r \sim .5$), we averaged the scores of ECR-RS across all domains for both anxiety and avoidance dimension respectively and use this aggregated value as a secondary measure of global attachment style (R. C. Fraley et al., 2011). Table 6 report the correlations between averaged ECR-RS and relationship-specific perspective taking. The avoidance dimension of averaged ECR-RS was correlated with perspective taking within a relation with mother, father, and best friend (all $rs < .31$, all $ps < .05$) whereas anxiety dimension was not correlated with any of relationship-specific perspective taking scores

Table 7A. Multiple linear regression analyses predicting perspective taking within relational domains.

		Predictors				Perspective taking			
		B	SE B	β	Adjusted R ²	B	SE B	β	p
mother									
Step 1									
	constant	2.60	0.57		-.02				
	gender	0.03	0.23	.01					
	age	-0.01	0.03	-.05					
Step 2									
	constant	-0.08	0.38		.73				
	gender	-0.03	0.12	-.01					
	age	-0.02	0.01	-.09					
	average								
	ECR-RS anxiety	-0.01	0.04	-.01					
	average								
	ECR-RS avoidance	0.02	0.06	.02					
	average								
	perspective taking	1.16	0.07	.87					<.001
Step 3									
	constant	-0.76	0.38	-.04	.77				
	gender	-0.09	0.11	-.04					
	age	-0.01	0.03	-.03					
	average								
	ECR-RS anxiety	0.03	0.05	.04					
	average								
	ECR-RS avoidance	0.27	0.08	.28					.002
	average								
	perspective taking	1.22	0.07	.91					<.001
	ECR-RS anxiety	-0.04	0.04	-.08					
	ECR-RS avoidance	-0.17	0.04	-.31					<.001
father									
Step 1									
	constant	1.24	0.66		.02				
	gender	-0.13	0.26	-.05					
	age	0.04	0.03	.14					
Step 2									
	constant	-0.90	0.60		.54				
	gender	-0.16	0.19	-.05					
	age	0.04	0.02	.12					
	average								
	ECR-RS anxiety	-0.06	0.07	-.07					
	average								
	ECR-RS avoidance	-0.08	0.09	-.07					
	average								
	perspective taking	1.07	0.12	.69					<.001
Step 3									
	constant	-0.08	0.18	-.03	.60				
	gender	0.02	0.02	.07					
	age								
	average								
	ECR-RS anxiety	-0.04	0.08	-.05					
	average								
	ECR-RS avoidance	0.27	0.12	.25					.03
	average								
	perspective taking	1.09	0.11	.70					<.001
	ECR-RS anxiety	0.00	0.06	-.01					
	ECR-RS avoidance	-0.26	0.06	-.44					<.001

P-values above .10 are hidden.

Note: R² change for each dependent variable:

mother: R² = .01 for Step 1, $\Delta R^2 = .74$ for Step 2 ($p < .001$), $\Delta R^2 = .05$ for Step 3 ($p < .001$)

father: R² = .02 for Step 1, $\Delta R^2 = .52$ for Step 2 ($p < .001$), $\Delta R^2 = .09$ for Step 3 ($p < .001$)

romantic partner: R² = .05 for Step 1, $\Delta R^2 = .46$ for Step 2 ($p < .001$), $\Delta R^2 = .04$ for Step 3 ($p = .01$)

best friend: R² = .01 for Step 1, $\Delta R^2 = .61$ for Step 2 ($p < .001$), $\Delta R^2 = .09$ for Step 3 ($p < .001$)

(all $ps > .1$). Given these results, we included averaged ECR-RS scores in the following regression analyses to test for the unique effects of specific attachment style in comparison to global attachment style with respect to perspective taking as a target variable.

Eventually, we examined whether the possible associations between attachment and mentalization disregarding relationship context can also be found. We analysed therefore the performance on the RMET-R task.

We did not find any significant correlations between attachment, in terms of both ECR and ECR-RS scores on both anxiety and avoidance dimensions for each relational domain, and RMET-R (all $ps > .2$). Further, we performed correlation analyses using the average score of ECR-RS for anxiety and avoidance dimension, respectively, and RMET-R as a target variable. Again, we did not find any significant results (all $ps > .3$).

In order to examine possible theoretical implications that could suggest an existence of such associations, we tested whether there are any differences in the RMET-R scores and global attachment styles (secure, ambivalent, avoidant, and disorganized attachment style). We used median-split analysis for the ECR anxiety and avoidance attachment scores to perform 2 (ECR avoidance: low vs high) by 2 (ECR anxiety: low vs high) between-subjects ANOVA. We did not find any significant results for main effect of anxiety, avoidance, nor for the interaction effect with respect to the RMET-R scores.

Regression analyses

Using hierarchical multiple linear regression, we examined the relationship between attachment and relationship-specific mentalization for each and every relational domain, respectively. Each regression model comprises three blocks. In the first block, we entered gender and age as predictors, because the group of subjects was heterogeneous with respect to age and relatively homogenous with respect to gender. Additionally, evidence shows that women typically score better than men at mentalizing tasks (e.g., Hampson, van Anders, & Mullin). In the second block, we entered global avoidance and anxiety attachment score expressed by the average of ECR-RS scores across all domains and similarly the average score of perspective taking. We did not use ECR in the model, because ECR scores were highly correlated with the specific attachment style to romantic partner and could have biased the regression analyses. The average score of perspective taking was used to indicate in the model the overall one's tendency to take perspective of others. In the third block, we entered relationship-specific attachment to test specifically whether specific attachment style predicts relationship-specific perspective taking over and above the global attachment style.

In each model additional predictors entered in the second and third block significantly increased the predictive value of the model (see Table 7). Relationship-specific avoidance turned out to significantly predict relationship-specific perspective taking for each relational domain (the β values are in the range of $-.29$ to $-.44$, all $ps < .01$)

indicating that specific attachment-related avoidance is related to the decrease in motivation to take the perspective of another person. Moreover, relationship-specific avoidance entered in the third block significantly increased overall's model predictive value over and above the global attachment-related avoidance. Relationship-specific anxiety did not predict relationship-specific perspective taking. Global perspective taking was a significant predictor of relationship-specific perspective taking (the β values are in the range of $.66$ to $.91$, all $ps < .001$). Global attachment-related avoidance was a significant predictor for all relational domains (the β values are in the range of $.18$ to $.28$, all $ps < .05$) and gender was a significant predictor of perspective taking toward romantic partner ($\beta = .18$, $p = .02$), indicating that men tend to more often take the perspective of their romantic partners compared to women.

Discussion

Recent research has linked mentalization to the development of attachment system and showed that secure attachment facilitates mentalization (Fonagy et al., 2011; Fonagy et al., 2002). In the current study, we investigated whether relationship-specific mentalization is related to the quality of specific attachment relationships which, in turn, would inform us about factors underlying within-person fluctuations of mentalization. We presented that relationship-specific mentalization reflected in perspective-taking is embedded within specific attachment relationships as perspective-taking toward a particular attachment figure corresponds well with the respective relationship-specific attachment style. Our findings indicate that the link between attachment quality and mentalization is relationship-specific. Specifically, we showed that relationship-specific attachment avoidance decreases perspective taking, here the tendency for engaging in reading about attachment figure's mental states, and thus specific attachment-related avoidance is an important social factor affecting within-person variation in mentalization. This was supported by the fact that relationship-specific attachment predicted relationship-specific mentalization over and above the global attachment style. Further, we showed that the type of relationship (e.g., mother vs. best friend) was not related to perspective taking as the latter was explained only by specific attachment avoidance in each relational domain.

By contrast, our study showed that performance on the ToM task, i.e. Reading the Mind in the Eyes-Revised (Baron-Cohen et al., 2001), tapping more global characteristics of mentalization disregarding interpersonal context, was unrelated to neither global nor specific attachment style. These findings contradict evidence according to which attachment quality is linked to mentalization and recent findings by Hunefeldt et al. (2013) who reported that attachment-related anxiety in a relationship with mother was associated with less accurate mindreading in terms of scores at Reading the Mind in the Eyes Task in the sample of adolescents.

There are two important issues that have to be taken into consideration here. Most research that links attachment

quality to mentalization was conducted in children, typically in infant-mother relationships and had strictly developmental nature. This line of research investigates the acquisition of mentalization rather than factors leading to its fluctuations when it has been already established (Fonagy et al., 2002; Meins et al., 2002). Research in the domain of developmental psychopathology gives us such an example. Namely, delayed ToM understanding has been found in maltreated children (Cicchetti et al., 2003; Pears & Fisher, 2005). Therefore, extreme negative experience in the context of attachment such as abuse and neglect leads to trait-like deficits in mentalization which, in addition, reflect the broader intellectual delays of maltreated children (Macfie, Cicchetti, & Toth, 2001).

However, since mentalization has been established, we may still observe its transient impairments associated with relative activation of attachment system (Fonagy & Luyten, 2009). Samples of adults, adolescents, and children differ in relation to their susceptibility for as well as factors that lead to attachment system activation in response to anxiety, or stress more broadly (Bowlby, 1969; Mikulincer & Shaver, 2007). Initial studies suggest that stress might influence mentalizing capacity leading to relative deactivation of brain circuits involved in controlled mentalization and further to impairments in social understanding (for a theoretical overview, see Fonagy & Luyten, 2009). Attachment-related anxiety has been associated with increased sensitivity to facial cues, and particularly to negative facial features (C. R. Fraley et al., 2006). Moreover, profound attachment activation observed in studies collecting Adult Attachment Interview narratives (e.g., Fonagy & Target, 1997), which are typically very affectively charged as one discusses his/her own attachment history, lead to observable impairments in mentalization. This implies that early attachment history indeed affects and is reflected in mentalization capacity but in a more state-like fashion and thus is observable in paradigms or protocols that eventually activate attachment system. In studies like ours where the procedure left attachment system deactivated, the possible impact of attachment-related anxiety on mentalization was difficult to observe. These postulations have been observed in clinical samples. For instance, patients with borderline personality disorder (BPD), typically marked by mentalizing difficulties, can perform successfully on mentalizing tasks while being under low level of stress (Fertuck et al., 2009).

Mentalization has both trait and state-like features and transient inhibitions of mentalization are particularly linked to attachment activation. Research shows that increasing level of anxiety can hinder (controlled) mentalization in relation to close others (e.g., Hunefeldt et al., 2013). However, these impairments seem to be linked specifically to hypervigilance (Mikulincer & Shaver, 2007), poor affect judgements, and misinterpretations of facial cues of significant emotional value (C. R. Fraley et al., 2006), but not necessarily to other factors influencing per se the tendency for the use of mentalization. On the other hand, attachment-related avoidance does seem to reflect motivational aspects for engaging in reading others'

mental states. Indeed, attachment-related avoidance has been associated with decreased empathy (Mikulincer et al., 2001), and based on our results perspective taking may encompass attachment-related avoidance such that less self-reported insecurity corresponds with perspective taking performed more frequently and freely (see also, Davis, 1983). These effects might be driven specifically by deactivating attachment strategies observed in avoidant individuals who aim to assert one's own autonomy and deny attachment needs, and subsequently withdraw from close relationships by disattending from their mental interior.

Although the investigation of the relationship between global and specific attachment style was not the main purpose of this study, we would like to point out to our findings in this context because of the two following reasons. Firstly, there were relatively modest correlations between the attachment dimensions across relational domains which testify to the nuances of attachment across relationships. It has been recently suggested to adequately measure attachment by taking into account its relationship-specificity (Baldwin et al., 1996; R. C. Fraley et al., 2011; Klohnen et al., 2005). Essentially, it might be advisable for researchers to assess individual differences in a specific relational domain rather than to assume that a more global or less specific measure captures the variance of their interest, and this is particularly important for the research investigating the influences of attachment on mentalization. Secondly, in our study, global attachment style correlated mostly with specific attachment style to romantic partner. These findings suggest that the ECR measure, used in our study to capture the variance of global attachment style across relationships with close others (variety of relational domains), was more relevant for global representation of attachment within a romantic domain, even though we deliberately left the target of inventory statements vague. This effect might have been driven by the items itself which refer to thoughts, feelings, and behaviours that are typical for romantic relationships. Thus, the ECR measure, despite typically being used as a global measure of attachment, seems to capture mostly variance that is relevant to the romantic domain (c.f., R. C. Fraley et al., 2011). Romantic relationships are mostly influential onto global attachment style in early adulthood as they constitute the core of interpersonal schemas in this developmental phase (c.f., Mikulincer & Shaver, 2007; Pietromonaco & Feldman, 2000). Indeed, attachment literature posits that the main person who mostly serves attachment functions during early adulthood is a romantic partner. As such, in our study global attachment style might have reflected the interpersonal schemas of relationships with romantic partners. Available research on mentalization is exhaustively focused on early attachment with caregivers as a putative predictor for mentalization quality, neglecting the role of later relationships in this interplay. We may therefore consider whether the scores on ToM task would be related to global attachment style if the latter reflected better attachment history with early caregivers as studies using Adult Attachment Interview suggest (e.g., Bouchard et al., 2008).

For future research, it should be tested whether global secure attachment style predicts that the capacity to mentalize is effective in all contexts over and above the influence of specific insecure attachment to certain persons. Particularly, research on stress involving different levels of interpersonal anxiety would inform us further about within-person variability of mentalization. Last but not least, a better conceptual framework and research is needed to explain the extent to which the constructs of mentalization and attachment overlap and can be distinguished in terms of, e.g., cognitive representations of attachment. Bowlby (1969) posited that the final phase of attachment development involves the infant's ability to represent mental states of his or her attachment figure to successfully regulate the behaviour in a goal-corrected manner and, as such, mentalization is an ingrained part of attachment relationships.

Limitations

There are several limitations of the study that need to be considered. First of all, our group of participants were relatively biased with respect to gender and age. Most of them were women in their early adulthood which might have influenced our results with respect to the role of romantic attachment and perspective taking towards their romantic partners or fathers. The range of age between 19-42 years stipulates that participants might have had different relational experiences constituting a quite heterogeneous group with respect to having been a mother or wife in comparison to be in an informal relationship. Secondly, the methods we used tap different aspects of mentalization. Perspective taking is more internally-focused whereas reading the mind in the eyes task is specifically externally-focused associated with facial emotion recognition. Moreover, one is a self-report instrument investigating one's opinion about their behaviours and the other one is administrated in a form of a classical test with a certain number of points to score. Since we investigated the possible within-person fluctuations in mentalization, it is important to note that in our study perspective taking across relational contexts were relatively minimal, possibly due to the relative small heterogeneity in specific attachment styles across participants (cf. R. C. Fraley et al., 2011). Further, Reading the mind in the eyes task had a very low internal reliability ($\alpha = .44$) which restricts inferential statistics on this measure. With respect to attachment style, we already mentioned that the Experiences in Close Relationships Scale measured mostly romantic domain rather than global aggregated representation of all close relationships. The Experiences in Close Relationships-Relationships Structure Scale (ECR-RS), although useful to capture more relationship specific aspects of attachment, is not able to control for a situation where participants treat their romantic partner as their best friend. The latter might have influenced the scores of perspective taking as we reported no differences between perspective taking towards romantic partner and best friend. Additionally, ECR-RS does not control whether participants respond to items in relational domain considering their actual romantic partner or their all romantic experiences disregarding any specific person.

Conclusion

In sum, our findings suggest that the investigation of mentalization should take into account the role of social context, and specifically the quality of relationship-specific attachment. Analysis of state-like mentalization can complement more frequent analyses of its trait-like aspects. Further studies might investigate putative factors affecting mentalization within specific attachment relationships and further explain the relationship-specific dimension of mentalization and its within-person fluctuations.

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