

Are adult mentalizing abilities associated with mind-mindedness?

Abstract

The precise nature of the relation between adult mentalizing abilities and parental representations of the child as a mental agent (mind-mindedness) is under current debate. While some authors state that it is the same competence expressed in different contexts, others assert that they are different constructs. This study examined the relation between mentalizing and mind-mindedness, in mothers and fathers, while investigating their potential links to socio-demographic, parental, and child variables. Participants were 74 families comprising of mother, father, and their preschool-aged child. Controlling for educational level, psychopathological symptoms, and children's reported temperament, the relation between mentalizing and mind-mindedness was non-significant. Moreover, mentalizing and mind-mindedness were shown to have distinct correlates, supporting the proposal that they are two distinct constructs.

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Adult mentalizing concerns the capacity to think about agents, taking their mental states (e.g., desires, beliefs, feelings, intentions) into consideration (Apperly et al., 2009), and its use in everyday life. It can be assessed in terms of adults' ability to use their mentalizing skills in communicating with others (Epley, Morewedge, & Keysar, 2004), considering others' visual perspectives (Samson, Apperly, Braithwaite, Andrews, & Scott, 2010), and decoding others' mental states based on eye expressions (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001).

Adult mentalizing abilities have also been assessed in the context of the parent–child relationship (Sharp & Fonagy, 2008). Notably, the construct of *mind-mindedness* focuses on the extent to which parents represent and describe their children as individuals with a mind (Meins, Fernyhough, Russell, & Clark-Carter, 1998). Parents vary widely in their focus on mental characteristics when describing their children, as do adults when describing a best friend or romantic partner (Meins, Fernyhough, & Harris-Waller, 2014).

The precise origins of individual differences in mind-mindedness remain open to debate. Some authors conceptualize mind-mindedness as an operationalization of parental mentalizing within the parent–child relationship/interaction (Sharp & Fonagy, 2008), which would lead one to expect a positive association between parents' mind-mindedness and their more general mentalizing abilities. In contrast, Meins et al. (2014) propose that mind-mindedness is a quality of close relationships rather than a trait. Meins et al. reported that adults tended to use more mental attributes when describing individuals with whom they had a close relationship than when describing famous figures or works of art, although some individuals failed to mention a mental characteristic when describing a significant other. Meins et al. thus argued that mind-mindedness is distinct from mentalizing because it indexes an individual's tendency spontaneously to use their

mentalizing to describe and understand people, rather than their basic capacity to understand other minds.

In line with this argument, Meins, Fernyhough, Johnson, and Lidstone (2006) reported that children's mental descriptions of a best friend and their tendency to describe the behavior of a story protagonist with reference to their internal states were unrelated to children's performance on a theory of mind task. However, the relation between mind-mindedness and mentalizing has not been investigated in adults; this was the main aim of this study. If mind-mindedness is a relational construct that indexes an individual's spontaneous use of internal state understanding to represent others, one would predict that mind-mindedness will not be strongly associated with more basic mentalizing abilities that require only the recognition of or reasoning about others' mental states.

A further aim was to explore how parents' mind-mindedness and mentalizing related to parent and child characteristics. Previous research has shown that mentalizing abilities are positively associated with age (e.g., Duval, Piolino, Bejanin, Eustache, & Desgranges, 2011) and education level (Li, Wang, Wang, Tao, Xie, & Cheng, 2012), and negatively related to depression (e.g., Lee, Harkness, Sabbagh, & Jacobson, 2005). In contrast, maternal mind-mindedness is unrelated to education level, socioeconomic status (SES), and depression (McMahon & Meins, 2012; Meins et al., 1998; Walker, Wheatcroft, & Camic, 2012), although a negative association with parenting stress has been reported (McMahon & Meins, 2012; Walker et al., 2012). The different associations seen with these parent-centered factors provide further support for the notion that mentalizing and mind-mindedness are separate constructs. The present study investigated relations between parent-centered factors and both mentalizing and mind-mindedness, including a measure of diverse psychopathological symptoms to explore relations with psychological wellbeing in greater depth.

Just as mind-mindedness appears unrelated to parent-centered factors, previous research has reported that parents' tendency to describe their children with reference to mental characteristics is unrelated to child-centered factors such as gender and general cognitive ability (McMahon & Meins, 2012; Meins et al., 1998). However, relations between mind-mindedness and other child characteristics have not been explored. Previous research using observational assessments of mind-mindedness in the first year of life (Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins et al., 2012) found that mothers' use of mind-related comments when interacting with their infants was unrelated to reported child temperament (Meins, Fernyhough, Arnott, Turner, & Leekam, 2011). The present study was the first to investigate whether parents' mind-minded descriptions related to perceptions of their children's temperament.

Finally, we included both mothers and fathers to explore whether the pattern of effects differed as a function of parent gender. Lundy's (2013) study is unique in investigating mind-mindedness in both mothers' and fathers' descriptions of their children. She reported that mothers and fathers did not differ in mind-mindedness, and that there was concordance in mind-minded descriptions within mother-father couples. However, whereas maternal mind-mindedness was unrelated to socioeconomic status (SES), fathers' SES was positively correlated with their mind-mindedness. The present study sought to replicate these findings and also explore whether maternal and paternal mind-mindedness was similarly related to child-centered characteristics.

In summary, the present study investigated whether (a) mentalizing abilities and mind-mindedness were related in mothers and fathers, (b) maternal and paternal mind-mindedness related to parents' psychopathological symptomatology and children's reported temperament, and (c) there was concordance in mind-mindedness within couples.

Method

Participants

Participants were 76 families, recruited in child-care centers in Oporto's Metropolitan area, Portugal. One mother and two fathers could not participate in the respective assessment sessions, and one mother did not have Portuguese as her first language, and were excluded from the analyses. Thus, 74 mothers and 74 fathers participated in this study. Mothers were aged between 26 and 46 years ($M = 36.88$, $SD = 3.62$), and fathers between 25 and 69 years ($M = 38.64$, $SD = 6.23$). The majority of the couples (82.9%; $n = 63$) were married. Most of the mothers (68.9%; $n = 51$) had a degree, 11 mothers (14.9%) had a masters or doctoral degree, while the remaining 16.2% ($n = 12$) had up to 12 years of formal education. Similarly, the majority of fathers (42.5%; $n = 31$) had a degree, 12 had a masters or doctoral degree (16.4%) and 30 (41.1%) had up to 12 years of formal education. Children were aged between 53 and 60 months ($M = 55.08$, $SD = 1.59$). Parents gave informed consent for participation in the study.

Materials and Methods

Mothers and fathers visited the laboratory separately, with their children. In each session, adults' mentalizing and parental mind-mindedness were first assessed. Participants then provided socio-demographic information and completed questionnaires to assess their psychopathological symptomatology and their perceptions regarding children's temperament.

Mentalizing Abilities. Mothers' and fathers' mentalizing abilities were assessed using the *Visual Jokes Task* (Corcoran, Cahill, & Frith, 1997). This measure has been mainly used with clinical populations. It has been shown to be sensitive to distinct levels of mentalizing, distinguishing individuals with schizophrenia from healthy controls (Corcoran et al., 1997; Marjoram et al., 2005).

Mothers and fathers were presented with 10 black and white pictures, five physical jokes (requiring only an interpretation of the characters' behavior) and five mental jokes (requiring attribution of mental states such as ignorance, false belief, or deception to the characters). The

order of presentation of the pictures was counterbalanced for each participant, as was the set of ten visual jokes presented to mothers and fathers in the same family, so that each partner always saw different pictures. Mothers and fathers were told that they were going to be presented with a set of pictures which were somehow funny; they were then asked to explain what they thought was funny about each picture. Maternal and paternal interpretations were audiotaped and subsequently transcribed verbatim.

Transcripts were coded for the degree of mentalizing in a scale ranging from 0 to 3. A score of 0 was attributed when the participants did not get the joke, or simply mentioned the elements of the picture (e.g., “The mice and a snake”); when the participant made a purely physical/behavioural description of the picture, a score of 1 was attributed (e.g., “The snake is watching the mice”); when there were implicit references to the characters’ mental states, entailing some degree of inference by the coder, a score of 2 was given (e.g., “The snake has mouse ears so it can eat the mice”); when the characters’ mental and/or emotional states were considered and explicitly referred to in the interpretation of the picture, a score of 3 was attributed (e.g., “The snake wants to eat the mice, so it is disguised as one of them”). The rater was blind to all other data, and a randomly selected 31% ($n = 24$) of maternal and paternal transcripts was coded by a second blind coder. Inter-rater reliability assessed by intraclass correlation coefficients (r_{ICC}): for the physical jokes, Mean $r_{ICC} = .88$ (mothers) and Mean $r_{ICC} = .90$ (fathers); for the mental jokes, Mean $r_{ICC} = .97$ (mothers) and Mean $r_{ICC} = .92$ (fathers). An average score for the mental jokes was used to index mentalizing abilities.

Furthermore, participants’ use of mental references, such as desires (e.g., like, dislike, want), cognitions (e.g., think, know, understand) and emotions (e.g., happy, sad, angry) when describing the visual jokes was also coded, and calculated as proportions of the total number of words used ($r_{ICC} = 1$ for mothers and $r_{ICC} = .98$ for fathers).

Mind-mindedness. Mothers' and fathers' mind-mindedness was assessed using the *Describe your Child Interview* (Meins et al., 1998). Parents were asked to describe their child. Responses were audiotaped and subsequently transcribed verbatim. Transcripts were coded by two independent raters, following an adaptation for the Portuguese language (Osório, Castiajo, Martins, & Meins, 2009) of the mind-mindedness coding system (Meins et al., 1998).

Each attribute used by the parent was coded into one of five mutually exclusive and exhaustive categories: mental, behavioral, physical, general, or self-referential attributes. *Mental attributes* included any reference to the child's mental life, such as his/her will, mind, imagination, interests, memory, or intellect (e.g., "he is very curious"). *Behavioral attributes* included references to child's behaviors, such as interactions with others and activities enjoyed by the child (e.g., "he is friendly"). *Physical attributes* included references to child's physical characteristics, such as age, or position in the family (e.g., "beautiful"). *General attributes* included parental comments that did not fit in any of the previous categories (e.g., "she's lovely"). Finally, *self-referential attributes* regarded parental comments that were self-focused, describing the child referring to indirect effects on the mother/father (e.g., "she amuses me"). The mind-mindedness score was expressed as a proportion of the number of mental attributes divided by the total number of attributes the parent used during the interview.

A randomly selected 31% ($n = 24$) of maternal and paternal interviews was coded by two investigators, and inter-rater agreement was $\kappa = .92$ for mothers, and $\kappa = .80$ for fathers.

Psychopathological Symptomatology. Mothers and fathers completed the Portuguese version of the Brief Symptom Inventory (BSI; Derogatis, 1993; Portuguese version, Canavarro, 1999). This questionnaire comprises 53 items, rated on a 5-point likert scale of distress, ranging from "not-at-all" (0) to "extremely" (4), and assesses the presence of the following symptoms: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility,

Phobic Anxiety, Paranoid Ideation, and Psychoticism. These dimensions compose three Global Indices: Global Severity Index, Positive Symptom Total, and Positive Symptom Distress Index. Cronbach's Alpha for the Portuguese version ranged between .62 and .80, for the nine scales.

Reported Child Temperament. Mothers and fathers completed the Portuguese short version of the Child Behavior Questionnaire (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001; Portuguese version, Franklin, Soares, Sampaio, Santos, & Veríssimo, 2003), assessing parental perceptions of their children's temperament and behavior. This version comprises 94 items, describing children's reactions to diverse situations, which parents rate on a 7-point scale, ranging from 1 ("Extremely untrue") to 7 ("Extremely true"). The items are arranged in 15 scales, which are then summed to give scores on three dimensions: Extroversion, Effortful Control, and Negative Affectivity. Cronbach's Alphas for the Portuguese version were .68, .69 and .60 for each of these three dimensions, respectively.

Results

Descriptive Statistics and Preliminary Analyses

Table 1 shows the descriptive statistics for all variables.

Mothers and fathers who obtained higher mentalizing scores when interpreting the mental jokes also did so when interpreting the physical jokes, $r(70) = .59, p < .001$ and $r(72) = .64, p < .001$, respectively. On the other hand, paired-sample t-tests showed that both mothers and fathers evidenced more mentalizing in interpreting the mental jokes, when compared to the physical ones, $t(71) = 6.21, p < .001$ and $t(73) = 7.46, p < .001$, respectively.

Correlates of Maternal and Paternal Mentalizing and Mind-Mindedness

Table 2 presents the correlations between mothers' and fathers' mentalizing and mind-mindedness and education level, psychopathological symptomatology, and reported child temperament.

Using Fisher's *r*-to-*z* transformation, we found that the correlation coefficients between mothers' and fathers' mentalizing and their correlates were not significantly different (all *ps* > .39). Conversely, using Steiger's *Z* method, we found a significant difference between maternal versus paternal mind-mindedness in relation to perceived children's extroversion, $Z = 2.50$, $p = .012$, with the correlation coefficient being larger for mothers than fathers.

Parental Mentalizing Abilities and Mind-mindedness

We found a trend-level association between mentalizing scores and mind-mindedness for both mothers, $r(70) = .21$, $p = .072$, and fathers, $r(72) = .21$, $p = .074$.

Next, based on the results from the correlational analyses described above, we performed hierarchical regression analyses to further examine the link between parental mentalizing and mind-mindedness, after accounting for their correlates. As shown in Table 3, after education level, psychopathological symptomatology, and reported child temperament were taken into account, mentalizing was not a significant predictor of mind-mindedness in either mothers or fathers. Moreover, both models were non-significant.

The pattern of results was similar when we analysed the relations between parents' use of mental references when describing the visual jokes, and mind-mindedness, $r_s < .24$, $\beta_s < .20$, $p_s > .05$.

Mind-Mindedness and Mentalizing Abilities in Mothers and Fathers

Mothers and fathers did not differ regarding their mentalizing score, $t(69) = .08$, $p = .93$, or mind-mindedness, $t(69) = .04$, $p = .97$. Furthermore, we found no significant correlation between mothers' and fathers' mentalizing, $r = .05$, $p = .68$, or between maternal and paternal mind-mindedness, $r = .09$, $p = .44$.

Power analysis for sample size adequacy

A series of sensitivity power analyses, using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009), were carried out, to find what would be the minimum detectable effect for 70- to-90% power and a sample size of 74. We concluded that we were able to detect small to medium effect sizes for correlations ($r \geq .25$) and for regressions ($f^2 \geq .06$).

Discussion

The main goal of this study was to examine the relation between mentalizing and mind-mindedness in mothers and fathers of preschool aged children. Our results extend those of Meins et al. (2006), who found no association between the way children described a friend as a mental agent and their mentalizing abilities. In the current study, the marginal associations between mentalizing and mind-mindedness became non-significant, both for mothers and fathers, after educational level, psychopathological symptoms, and children's reported temperament were accounted for. It is important to note that, despite the weak associations, these were small to medium effects. Furthermore, when we examined mothers' and fathers' use of mental references in describing the visual jokes as an index of mentalizing, our results were similar. These findings are consistent with the proposal that mind-mindedness and mentalizing are distinct constructs that tap different adult competences - a result congruent with Meins et al.'s (2006) findings. Mind-mindedness could, then, be more accurately conceptualized as a relational quality (Meins et al., 2014), while mentalizing seems to reflect more basic cognitive-behavioral competence.

Additionally, when investigating the possible correlates of adults' mentalizing and mind-mindedness, we found that the two were associated with different sets of variables. Mentalizing was linked to mothers' socio-demographic and individual characteristics, such as educational level and psychopathological symptoms, in line with previous investigations (e.g., Lee et al., 2005; Li et al., 2012). Our study thus extends prior research by showing that higher overall levels of psychopathological symptoms, and not only depressive symptoms, are associated with poorer

mentalizing in a normative sample. Moreover, mothers' mentalizing was related to perceptions concerning their children's effortful control. It is possible that mothers who show more mentalizing are more sensitive to certain characteristics of their children, such as attentional and perceptive ones, thus perceiving their children as having more effortful control. Conversely, the regression analyses showed that mind-mindedness was not predicted by these maternal individual characteristics or by children's reported temperament. Regarding correlates of fathers' mentalizing and mind-mindedness, the only significant relation was a positive association between fathers' mentalizing and their education qualifications.

Comparing data from mothers and fathers, the correlation coefficient between mind-mindedness and children's perceived extroversion was larger for mothers than fathers. It is possible that the way parents represent their children is accessing some individual characteristics or specificities of their relationship with their children, which may differ for mothers and fathers. Accordingly, and contrasting with previous evidence (Lundy, 2013), we found no concordance between mothers' and fathers' mind-mindedness.

Some methodological issues should be considered when interpreting our findings. First, we assessed mentalizing based on adults' ability to consider mental states when interpreting others' behavior, looking at humorous cartoons. Future studies should assess other aspects of adult mentalizing, such as its use during online communication (Keysar, Barr, Balin, & Brauner 2000), to further explore potential relations between mentalizing and mind-mindedness. Second, previous research has consistently shown a link between adults' mentalizing and their executive functioning (e.g., Apperly et al., 2009). Thus, including a measure of executive functioning would provide an important index of cognitive competence that one would expect to be related to mentalizing, as a cognitive ability, and not to mind-mindedness, as a relational construct (Meins et al., 2014). Also, it is possible that assessing mind-mindedness based on parents' spontaneous descriptions of their

children is influenced by other factors, such as the ‘transparency’ or ‘opacity’ of the child’s mental states as manifested in overt behavior, or the richness or variety of social interactions that the parent draws upon when thinking about the child. It would be interesting to see if using a different assessment, such as asking parents to choose between characteristics most like their own child, rather than asking parents to think about the characteristics themselves, would produce different results. Finally, our sample was constituted mainly of highly educated two-parent families, with mothers as primary caregivers, so our results may not generalize to other populations. Thus, it would be interesting to establish whether these findings can be replicated in a more heterogeneous sample.

Future research aimed at exploring additional correlates of adults’ mentalizing and mind-mindedness will certainly provide important contributions to the notion of mentalizing and mind-mindedness as distinct constructs, the former being a cognitive-behavioral competence, and the latter being a relational construct (Meins et al., 2014). Such research would help further test the proposal that there is a “competence-performance gap” (Meins et al., 2006, 2014) between having the ability to mentalize and using this ability spontaneously in everyday life.

References

- Apperly, I. A., Carroll, D. J., Samson, D., Humphreys, G. W., Qureshi, A., & Moffitt, G. (2009). Why are there limits on theory of mind use? Evidence from adults' ability to follow instructions from an ignorant speaker. *The Quarterly Journal of Experimental Psychology*, 63(6), 1201-1217. doi: 10.1080/17470210903281582
- Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the mind in the eyes" test revised version: A study with normal adults, and adults with asperger syndrome and high functioning autism. *Journal of Child Psychology and Psychiatry*, 42, 241-251. doi: 10.1111/1469-7610.00715
- Canavaro, M. C. (1999). Inventário de sintomas psicopatológicos – BSI. In M. R. Simões, M. Gonçalves, & L. S. Almeida (Eds.), *Testes e Provas Psicológicas em Portugal* (pp. 87-109). Braga: SHO/APPORT.
- Corcoran, R., Cahill, C., & Frith, C. D. (1997). The appreciation of visual jokes in people with schizophrenia: A study of 'mentalizing' ability. *Schizophrenia Research*, 24, 319-327. doi: 10.1016/S0920-9964(96)00117-X
- Derogatis, L.R. (1993). *BSI Brief Symptom Inventory: Administration, Scoring, and Procedure Manual* (4th Ed.). Minneapolis, MN: National Computer Systems.
- Duval, C., Piolino, P., Bejanin, A., Eustache, F., & Desgranges, B. (2011). Age effects on different components of theory of mind. *Consciousness and Cognition*, 20(3), 627-642. doi: 10.1016/j.concog.2010.10.025
- Epley, N., Morewedge, C. K., & Keysar, B. (2004). Perspective taking in children and adults: Equivalent egocentrism but differential correction. *Journal of Experimental Social Psychology*, 40(6), 760-768. doi: 10.1016/j.jesp.2004.02.002

- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149-1160. doi: 10.3758/BRM.41.4.1149
- Franklin, L., Soares, I., Sampaio, A., Santos, O., & Veríssimo, M. (2003). Children's behavior questionnaire. Unpublished instrument.
- Keysar, B., Barr, D. J., Balin, J. A., & Brauner, J. S. (2000). Taking perspective in conversation: The role of mutual knowledge in comprehension. *Psychological Science*, *11*(1), 32-38. doi: 10.1111/1467-9280.00211
- Lee, L., Harkness, K. L., Sabbagh, M. A., & Jacobson, J. A. (2005). Mental state decoding abilities in clinical depression. *Journal of Affective Disorders*, *86*(2-3), 247-258. doi: 10.1016/j.jad.2005.02.007
- Li, X., Wang, K., Wang, F., Tao, Q., Xie, Y., & Cheng, Q. (2012). Aging of theory of mind: The influence of educational level and cognitive processing. *International Journal of Psychology*, *48*(4), 715-727. doi: 10.1080/00207594.2012.673724
- Lundy, B. L. (2013). Paternal and maternal mind-mindedness and preschoolers' theory of mind: The mediating role of interactional attunement. *Social Development*, *22*(1), 58-74. doi: 10.1111/sode.12009
- Marjoram, D., Tansley, H., Miller, P., MacIntyre, D., Owens, D. G. G., Johnstone, E. C., & Lawrie, S. (2005). A theory of mind investigation into the appreciation of visual jokes in schizophrenia. *BMC Psychiatry*, *5*(12), 1-8. doi: 10.1186/1471-244X-5-12
- McMahon, C. A., & Meins, E. (2012). Mind-mindedness, parenting stress, and emotional availability in mothers of preschoolers. *Early Childhood Research Quarterly*, *27*(2), 245-252. doi: 10.1016/j.ecresq.2011.08.002

- Meins, E., Fernyhough, C., Arnott, B., Turner, M., & Leekam, R. S. (2011). Mother-versus infant-centered correlates of maternal mind-mindedness in the first year of life. *Infancy, 16*(2), 137-165. doi: 10.1111/j.1532-7078.2010.00039.x
- Meins, E., Fernyhough, C., de Rosnay, M., Arnott, B., Leekam, S. R., & Turner, M. (2012). Mind-mindedness as a multidimensional construct: Appropriate and nonattuned mind-related comments independently predict infant-mother attachment in a socially diverse sample. *Infancy, 17*(4), 393-415. doi: 10.1111/j.1532-7078.2011.00087.x
- Meins, E., Fernyhough, C., & Harris-Waller, J. (2014). Is mind-mindedness trait-like or a quality of close relationships? Evidence from descriptions of significant others, famous people, and works of art. *Cognition, 130*(3), 417-427. doi: 10.1016/j.cognition.2013.11.009
- Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry, 42*(5), 637-648. doi: 10.1111/1469-7610.00759
- Meins, E., Fernyhough, C., Johnson, F., & Lidstone, J. (2006). Mind-mindedness in children: Individual differences in internal state talk in middle childhood. *British Journal of Developmental Psychology, 24*(1), 181-196. doi: 10.1348/026151005X80174
- Meins, E., Fernyhough, C., Russell, J., & Clark-Carter, D. (1998). Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development, 7*(1), 1-24. doi: 10.1111/1467-9507.00047
- Meins, E., Fernyhough, C., Wainwright, R., Clarke-Carter, D., Das Gupta, M., Fradley, E., & Tuckey, M. (2003). Pathways to understanding mind: Construct validity and predictive validity of maternal mind-mindedness. *Child Development, 74*(4), 1194-1211. doi: 10.1111/1467-8624.00601

- Osório, A., Castiajo, P., Martins, C., & Meins, E. (2009). *Manual de sistema de cotação mind-mindedness* [Mind-mindedness Coding System, Portuguese Version]. Unpublished manuscript.
- Rothbart, M., Ahadi, S., Hershey, K., & Fisher, P. (2001). Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. *Child Development, 72*(5), 1394-1408. doi: 10.1111/1467-8624.00355
- Samson, D., Apperly, I. A., Braithwaite, J. J., Andrews, B. J., & Scott, S. E. B. (2010). Seeing it their way: Evidence for rapid and involuntary computation of what other people see. *Journal of Experimental Psychology, 36*(5), 1255-1266. doi: 10.1037/a0018729
- Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychology. *Social Development, 17*(3), 737-754. doi: 10.1111/j.1467-9507.2007.00457.x
- Walker, T. M., Wheatcroft, R., & Camic, P. M. (2012). Mind-mindedness in parents of pre-schoolers: A comparison between clinical and community samples. *Clinical Child Psychology and Psychiatry, 17*(3), 318-335. doi: 10.1177/1359104511409142

Table 1. Mothers' and Fathers' Mentalizing, Mind-Mindedness, Psychopathological Symptomatology, and Reported Child Temperament

	Mothers (n = 74)			Fathers (n = 74)		
	Mean (S.D)	Range	Median	Mean (S.D)	Range	Median
<i>Mentalizing</i>						
Mean mental jokes score	1.66 (0.61)	0.00-3.00	1.60	1.64 (0.64)	0.40-3.00	1.80
<i>Mind-mindedness</i>						
Proportion of mental attributes	0.33 (0.18)	0.00-0.82	0.32	0.33 (0.20)	0.00-0.83	0.33
<i>Psychopathological symptomatology</i>						
Global Severity Index	0.42 (0.33)	0.02-1.66	0.36	0.47 (0.37)	0.02-1.91	0.42
Positive Symptom Total	16.26 (11.03)	1.00-43.00	14.00	18.11 (11.97)	1.00-53.00	18.00
Positive Symptom Distress Index	1.37 (0.47)	0.14-3.57	1.27	1.31 (0.38)	1.00-3.50	1.20
<i>Reported child temperament</i>						
Extroversion	82.37 (14.29)	52-107	83.00	79.57 (14.05)	33-105	80.50
Effortful Control	115.57 (8.58)	90-133	116.00	114.01 (8.57)	95-136	114.50
Negative Affectivity	135.57 (23.83)	79-197	135.50	138.44 (21.52)	84-190	136.50

Table 2. Correlations between Mothers' and Fathers' Mentalizing and Mind-mindedness and Socio-demographic, Psychopathological Symptomatology, and Reported Child Temperament

	Mentalizing		Mind-mindedness	
	Mothers	Fathers	Mothers	Fathers
<i>Socio-demographic variables</i>				
Education level ^b	.20 ⁺	.25*	.05	.16
<i>Psychopathological symptomatology</i>				
Global Severity Index ^a	-.06	.02	.07	-.12
Positive Symptom Total ^a	-.02	.06	.07	-.05
Positive Symptom Distress Index ^a	-.26*	-.18	.05	-.09
<i>Reported Child Temperament</i>				
Extroversion ^a	.06	.15	.27*	-.13
Effortful Control ^a	.28*	.14	.19	-.10
Negative Affectivity ^a	-.14	-.02	.14	-.09

⁺ $p < .10$; * $p < .05$ ^aPearson Coefficient Correlation; ^bSpearman Coefficient Correlation

Table 3. Regression model for mothers' (model A) and fathers' (model B) mind-mindedness

Model A	Steps and variables	R ²	(Adjusted R ²)	β	F change
	Step 1 (df 6,65)	.12	(.04)		1.46
	Education level (12 th grade vs. others)			-.09	
	Education level (Masters/doctoral degrees vs. others)			.14	
	Psychopathological symptomatology (Positive Symptom Distress Index)			.05	
	Maternal perceived children's extroversion			.25 ⁺	
	Maternal perceived children's effortful control			.20	
	Maternal perceived children's negative affectivity			.05	
	Step 2 (df 7,64)	.15	(.05)		1.95
	Education level (12 th grade vs. others)			-.08	
	Education level (Masters/doctoral degrees vs. others)			.12	
	Psychopathological symptomatology (Positive Symptom Distress Index)			.08	
	Maternal perceived children's extroversion			.22 ⁺	
	Maternal perceived children's effortful control			.14	
	Maternal perceived children's negative affectivity			.08	
	Mentalizing			.18	
Model B					
	Step 1 (df 6,65)	.06	(-.03)		.69
	Education level (12 th grade vs. others)			-.05	
	Education level (Masters/doctoral degrees vs. others)			.14	
	Psychopathological symptomatology (Positive Symptom Distress Index)			-.09	
	Paternal perceived children's extroversion			-.06	
	Paternal perceived children's effortful control			-.10	
	Paternal perceived children's negative affectivity			-.06	
	Step 2 (df 7,64)	.09	(-.01)		2.13
	Education level (12 th grade vs. others)			-.01	
	Education level (Masters/doctoral degrees vs. others)			.11	
	Psychopathological symptomatology (Positive Symptom Distress Index)			-.07	
	Paternal perceived children's extroversion			-.12	
	Paternal perceived children's effortful control			-.14	
	Paternal perceived children's negative affectivity			-.04	
	Mentalizing			.19	

⁺ $p < .10$