

The role of contextual, personal, and/or parenting-related factors in individual differences in parental mind-mindedness ability: A scoping review

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Abstract

Mind-mindedness refers to a parent's tendency to treat a young child as an individual with a mind. Previous research has convincingly demonstrated that mind-mindedness has positive associations with a child's development. However, much less is known about the factors that influence (variation in) parental mind-mindedness. This scoping review aimed to explore what has been published in the past five years on contextual, personal, and/or parenting-related factors that potentially contribute to individual differences in parental mind-mindedness ability. Also, based on the available literature, it is attempted to reliably identify which contextual, personal, and/or parenting-related factors are contributing to parental mind-mindedness ability. In the data collection, the framework for scoping reviews by Arksey and O'Malley was followed. To identify relevant literature, nine electronic databases were searched, and a quality assessment was performed. A total of 21 articles were included in this review. Based on the findings of these included studies, promising results were found on associations between culture, parent's age, parent's gender, maternal depression, parent's attachment, child's psychopathology, and planned pregnancy and experience of the pregnancy and parental mind-mindedness ability. The effects of culture and parent's age on parental mind-mindedness ability were also identified in previous research and can therefore be reliably identified as contributing to parental mind-mindedness ability. Interventions can focus on parents who naturally have a lower tendency to be mind-minded, such as young mothers and parents from more collectivistic cultures.

Samenvatting

Mind-mindedness verwijst naar de neiging van een ouder om een jong kind te behandelen als een individu met een eigen bewustzijn. Uit eerder onderzoek is gebleken dat *mind-mindedness* positieve uitkomsten heeft op de ontwikkeling van het kind. Minder is bekend over wat individuele verschillen in ouderlijke *mind-mindedness* veroorzaakt. Deze studie heeft getracht te verkennen wat de afgelopen vijf jaar is gepubliceerd over contextuele, persoonlijke en/of ouderschaps-gerelateerde factoren die potentieel bijdragen aan individuele verschillen in ouderlijke *mind-mindedness*. Op basis van beschikbare literatuur is getracht te achterhalen welke contextuele, persoonlijke en/of ouderschaps-gerelateerde factoren op betrouwbare wijze kunnen worden geïdentificeerd als bijdragend aan ouderlijke *mind-mindedness* capaciteiten. In de dataverzameling werd het raamwerk voor scoping reviews van Arksey en O'Malley gevolgd. Om relevante literatuur te identificeren werden negen elektronische databases doorzocht en werd er een kwaliteitscontrole uitgevoerd. In totaal zijn 21 artikelen geïncorporeerd in deze studie. Associaties zijn gevonden tussen cultuur, leeftijd van ouders, geslacht van ouders, depressie in moeders, hechting van ouders, de psychopathologie van het kind, en geplande zwangerschap en zwangerschapservaringen en ouderlijke *mind-mindedness* capaciteit. De effecten van cultuur en leeftijd van ouders op het vermogen om *mind-minded* te zijn werden tevens in eerdere onderzoeken geïdentificeerd en kunnen daarom betrouwbaar worden geïdentificeerd als bijdragend aan het vermogen van ouders om *mind-minded* te zijn. Interventies kunnen zich richten op ouders die van nature minder geneigd zijn om *mind-minded* te zijn, zoals jonge moeders en ouders uit meer collectivistische culturen.

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Introduction

The concept of parental mind-mindedness was introduced by Elizabeth Meins almost 25 years ago and has sparked a plethora of research ever since. Parental mind-mindedness refers to a caregiver's tendency to treat a young child as an individual with a mind, instead of just an entity that must be satisfied (Meins, 1997, in McMahon & Bernier, 2017). To be mind-minded, a caregiver must accurately represent the infant's thoughts, feelings, emotions, preferences, motives, and/or goals, and voice this representation (Meins, 2013; Meins et al., 2012). Research has convincingly shown that (appropriate) parental mind-mindedness is associated with many positive outcomes in child development, including a better development of Theory of Mind (ToM) (Laranjo et al., 2014; Lundy & Fyfe, 2016; Meins et al., 2003; Meins & Fernyhough, 1999) and child's receptive and productive language (Lundy & Fyfe, 2016; Meins, 2013). However, not all parents are equally mind-minded (McMahon & Bernier, 2017), and much less is known about why differences in parental mind-mindedness ability occur. Since parental mind-mindedness positively influences the child's development, it is important to understand which factors are associated with parental mind-mindedness ability and may be a potential target for intervention. This study aims to improve our understanding of predictors of mind-mindedness variation, by exploring recently published research on contributing factors to parental mind-mindedness ability and to build upon the knowledge gathered in the 2017 review of McMahon & Bernier.

As described by Meins et al (2001), the origin of mind-mindedness is found in attachment theory, especially in the work of Ainsworth and colleagues on understanding early infant-caregiver interaction and maternal sensitivity. Mesman and Emmen (2013) described that according to Ainsworth sensitivity can be explained as a parent's ability to notice child signals, understand signals accurately, and respond to the signals immediately. Among other factors, parental sensitivity was proven to be a significant condition for attachment security (De Wolff & van Ijzendoorn, 1997). Even though mind-mindedness and parental sensitivity strongly relate, they do not capture the exact same aspects of parental behavior (Meins et al., 2001). Mind-mindedness concerns a specific cognitive element of sensitivity, namely the parent's ability to engage with the child at a mental level rather than to only respond to a child's physical and emotional needs (McMahon & Bernier, 2017). Mind-mindedness is part of the broader construct of mentalization, which also includes parental insightfulness and parental reflective functioning (Medrea & Benga, 2021). Even though these mentalization constructs are similar, they measure other aspects and could therefore

have different predictors. This review will solely focus on predictors of parental mind-mindedness.

In mind-mindedness, caregivers' attunement of mental states to their infant can be divided into two dimensions: appropriate mind-related comments and non-attuned mind-related comments. In the latter, the caregiver does not correctly attune to their infant's point of view. This could be a sign of the caregivers' own agenda regarding the identity of the child (Meins et al., 2012). In a situation where a child is enthusiastically playing with a dog, an appropriate mind-related comment could be that the parent appoints that the child likes playing with the animal (e.g.: *you like playing with the dog, don't you?*). A non-attuned comment in this situation could be that the parent appoints that the child wants to play with something else (e.g.: *you would rather play with the cars, don't you?*) (Meins & Fernyhough, 2015). This shows that not all mind-related comments are appropriate. Another form of parental mind-mindedness is when a parent puts words into the child's mouth. In this case, the communication does not have to include mind-related comments (e.g.: *That's my plushie, mommy.*) (Meins & Fernyhough, 2015).

A growing body of research demonstrates that appropriate parental mind-mindedness contributes to positive child developmental outcomes, including a better development of the child's ToM (Laranjo et al., 2014; Lundy & Fyfe, 2016; Meins et al., 2003; Meins & Fernyhough, 1999). ToM is a social-cognitive skill that refers to the ability to understand the mental states of others and to understand that these may differ from the child's own (Perner & Lang, 1999). Individual differences in ToM are important predictors of social competency, mental health, and quality of life. Well-developed ToM skills are essential for the development of abilities to socially communicate (Cutting & Dunn, 2006). This also indicates that better development of ToM is required for developing mind-mindedness later in life. Also, some evidence was found about a positive association between parental mind-mindedness and a child's receptive language at a later age (Lundy & Fyfe, 2016; Meins et al., 2013). Receptive language concerns a child's ability to understand oral language, and is important for successful communication and the understanding of verbal instructions. Single studies have also reported positive associations between parental mind-mindedness on the one hand and child sleep, and child executive functioning on the other hand (McMahon & Bernier, 2017). Finally, some studies found positive associations between mind-mindedness on the one hand and child regulation, child behavior, and cognitive school readiness on the other hand, but outcomes on these associations were more ambiguous (McMahon & Bernier,

2017). All in all, research convincingly indicates that parental mind-mindedness seems to have a positive influence on the development of the child.

Much less is known about why individual differences in parental' mind-mindedness abilities occur. That is, some parents are more mind-minded than others while some parents misinterpret their infant's mental state more often than others. Several studies have examined possible explanations for this variability in mind-mindedness (Meins et al., 2011; Hughes et al., 2017; Wang et al., 2017; Fishburn et al., 2017; McMahon & Bernier, 2017). It was for example found that mothers who had planned pregnancies, and mothers with more positive experiences of their pregnancy and/or the first contact with their newborn child showed more signs of appropriate maternal mind-mindedness compared to mothers who did not have this experience (Meins et al., 2011). Limited research has shown that parental mind-mindedness was more present in Western countries than in non-Western countries (Hughes et al., 2017; Wang et al., 2017). One study examined the difference in mind-mindedness between adoptive and biological parents, which showed that adoptive parents scored lower on appropriate mind-mindedness than biological parents. Also, parents with children in foster care or parents who are involved with child protection services showed less parental mind-mindedness (Fishburn et al., 2017). Single study findings showed a positive association between parental mind-mindedness and psychological mindfulness, and between mind-mindedness and psychological maturity. No consistent evidence was found for an association between mind-mindedness and education, socioeconomic status, mood disorders, and parental attachment style (McMahon & Bernier, 2017). Given that parental mind-mindedness has a positive influence on the development of the child, it seems particularly important to expand our knowledge of the factors that influence parental' mind-mindedness ability and may be a potential target for intervention.

Aim of the study

In 2017, McMahon and Bernier published a comprehensive narrative review of mind-mindedness since the first introduction of the concept in 1997. It revealed that much research on mind-mindedness has been conducted, particularly concerning the association between parental mind-mindedness and child outcomes, but less is known about individual differences in parental' mind-mindedness abilities. One of the recommendations of the authors is to further examine contextual, personal, and parenting-related factors that may contribute to variation in parental mind-mindedness abilities. This includes studying mind-mindedness in

different cultures, in fathers and childcare workers, as well as in atypical parental contexts (adopting/fostering) and in children with developmental disabilities (e.g. deaf children)'.

The aim of the current study is to add to the literature and provide an overview of the literature that has been published, specifically on contextual, personal, and/or parenting-related factors in parental mind-mindedness ability, since the publication of the 2017 McMahon & Bernier review paper. The current study will answer the following research questions: (1) '*What has been published since 2017 about contextual, personal, and/or parenting-related factors that potentially contribute to individual differences in parental mind-mindedness ability?*' and (2) '*Which contextual, personal, and/or parenting-related factors can be reliably identified, based on the available literature, as contributing to parental mind-mindedness ability?*'. It is expected that the publications identified in this review will add supporting or disputing evidence to previously (tentatively) identified relevant factors such as different cultures, parental sex, and atypical parenting contexts (adoption/fostering) (McMahon & Bernier, 2017), which will allow us to draw (more convincing) conclusions about the extent that these factors contribute to parental mind-mindedness ability. In addition, it is expected that other relevant factors that are (potentially) associated with parental mind-mindedness ability will be discovered. Since parental mind-mindedness has a positive influence on the development of children, it is important to expand our knowledge of which factors influence parental' mind-mindedness abilities. By identifying potential contributors to parental mind-mindedness ability, future research can focus on interventions to increase parental mind-mindedness abilities for parents who naturally have a lower tendency to be mind-minded. Such interventions could be beneficial for a child's development.

Method

To explore the literature a scoping review was performed. This type of review can be defined as: '*A form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence and gaps in research related to a defined area or field by systematically searching, selecting and synthesizing existing knowledge.*' (Colquhoun et al., 2014). The scoping review was set up following stages from the framework for scoping studies (Arksey & O'Malley, 2005):

Stage 1: Identifying the research question

First, the research questions: (1) '*What has been published since 2017 about contextual, personal, and/or parenting-related factors that potentially contribute to*

individual differences in parental mind-mindedness ability? and (2) *Which contextual, personal, and/or parenting-related factors can be reliably identified, based on the available literature, as contributing to parental mind-mindedness ability?* were formulated. Important facets of this question are ‘contextual factors’, ‘personal factors’, ‘parenting-related factors’, and ‘parental mind-mindedness ability’.

Stage 2: Identifying relevant studies

Relevant studies were identified through electronic databases that are accessible through the library of the University of Groningen. The electronic databases that were used in this study are Academic Search Premier, APA PsycInfo, ERIC, MEDLINE, Primary Search, Psychology and Behavioral Sciences Collection, PUBMED, SocINDEX, and Web of Science. Articles with a publication date between 1 August 2017 and 15 November 2022 on contextual, personal, and/or parenting-related factors in parental mind-mindedness ability were derived from the electronic databases. The demarcation of the publication date was chosen since the latest review study, by McMahon and Bernier (2017), conducted its last literature search in July 2017. This way, there was no overlap between the articles discussed in their review and this scoping review. To find the articles, the following combinations of keywords were used: contextual factors OR context OR environment AND mind minded* OR mind-minded* OR parental mind-mindedness ability, personal factors OR personal OR individual factors AND mind minded* or mind-minded* OR parental mind-mindedness ability, and parent* OR caregiver* OR mother* OR father* OR parent-related factors AND mind minded* OR mind-minded* OR parental mind-mindedness ability.

Stage 3: Study selection

After searching the databases for references, relevant studies were selected. The elimination of irrelevant studies was done in a few steps, based on the inclusion and exclusion criteria (see Table 1).

Table 1*Inclusion and exclusion criteria*

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Academic articles • Published after July 2017 • Describes contextual, personal, and/or parenting-related factors of parental mind-mindedness ability • Articles specifically mentioning the term mind-mindedness • Peer-reviewed • English-written 	<ul style="list-style-type: none"> • The main focus of the study is on child outcomes and not on contextual, personal, and/or parenting-related factors of parental mind-mindedness ability • Articles about parental sensitivity, parental reflective functioning, insightfulness, or parental (embodied) mentalization • Duplicates • Literature reviews and meta-analysis • Intervention studies

First, the title of the article was examined. To minimize the risk of excluding relevant studies, in this step the inclusion- and exclusion criteria were not strictly applied. All articles about mind-mindedness, similar concepts, and parent-child dyads were taken into the next step.

In case the title looked suitable, the abstract of the article was consulted. Just as in the previous phase, this step implemented the inclusion and exclusion criteria less strictly to minimize the chance of excluding relevant articles. However, articles that were solely about the association between mind-mindedness and child outcomes were excluded in this step.

Whenever the abstract seemed relevant, or if the relevance of the study was unclear, the full article was reviewed. After reviewing the full article, it was decided if the given information would fit within the scope of this study. The progression of in- and exclusion of articles has been tracked in the PRISMA flowchart (Page et al., 2021, see Figure 1). During the examination of an article, the quality of the study was assessed using the study quality assessment tools of the National Heart, Lung, and Blood Institute (2021, see Appendix 1).

Stage 4: Charting data

After relevant articles were selected, data was described in a ‘data charting form’ (Table 2). In this form, information about the article was recorded. Data that have been charted in the form are: author(s), year of publication, study location, study population, aims of the study, methodology, and important results.

Stage 5: Collating, summarizing, and reporting results

In the last stage, all the information was sorted, summarized, and reported. The additional steps of Levac et al (2010) to the framework of Arksey and O'Malley (2005) were followed. First, a descriptive numerical summary was provided. After that, the information from the articles was familiarized. This has been done by reading the literature thoroughly and scanning for possible themes. Subsequently, the information was divided thematically, based on the factors identified in the research question. The main themes derived from the research question are contextual factors, personal factors (both parent's and child's), and parenting factors. During the process, no themes were changed and no new themes emerged. After the main themes assignment, the articles were screened for subthemes. These subthemes have not been established prior to the analysis but were developed during the analyzation process. An example of a subtheme for contextual factors is 'culture'. After the themes and subthemes were determined, a thematical framework has emerged for the processing of the information from the articles. Based on this thematical framework, articles have been charted and summarized and the framework was followed in the structure of the results. A visual representation of the thematical framework is found in Table 3. After that, gained insights from the analysis are interpreted. Finally, an effort is made to build upon the knowledge derived from McMahon and Bernier (2017) and draw more convincing conclusions on which factors are associated with parental mind-mindedness ability.

Results

Included studies

The initial search identified a total of 1460 studies. The articles available on Academic Search Premier, APA PsycInfo, ERIC, MEDLINE, Primary Search, Psychology and Behavioral Sciences Collection, and SocINDEX were retrieved simultaneously, resulting in the automatic removal of duplicate articles. Searching these databases, 116 unique studies were identified when the following filters were used: range 1 August 2017 – 15 November 2022, peer-reviewed, and English-written. PubMed identified 162 studies while using the filters 1 August 2017 – 15 November 2022 and English-written. Web of Science identified 1182 studies while using the filters 1 August 2017 – 15 November 2022, articles, and English-written. To track down duplicates in the literature list, EndNote has been used. This resulted in the removal of 460 studies.

After that, the titles and keywords of the remaining 1000 studies were examined. A total of 841 studies were removed, because they referred to different subjects and seemed to

have no link with any contextual, personal, or parenting-related factors of parental mind-mindedness.

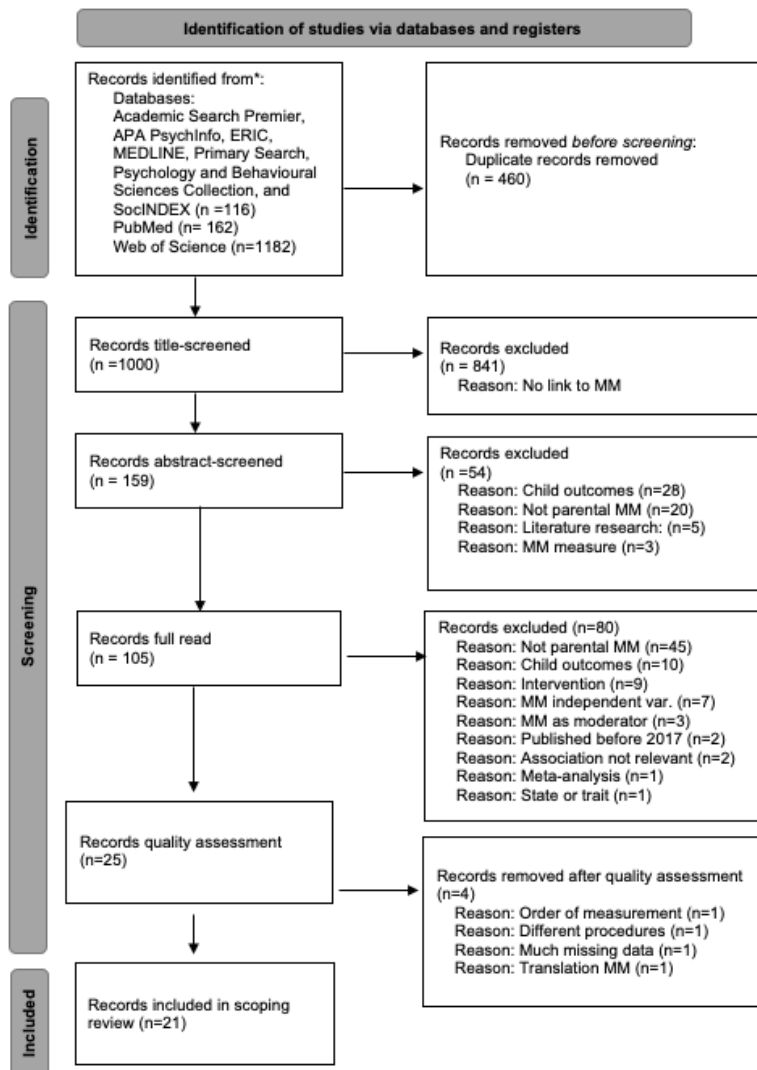
Thereafter, the abstracts of 159 articles were analyzed. This resulted in the removal of 28 articles because of a focus on child outcomes instead of predictive factors of parental mind-mindedness, 18 articles were removed because they did not cover parental mind-mindedness, five articles were removed because their methodology consisted of literature research, and three articles were removed because the effectiveness of a mind-mindedness measure was evaluated, or a new measure was developed. In total, 54 articles were excluded in this step.

Subsequently, 105 articles seemed appropriate for a full read. In this phase, 45 articles were removed because they did not cover parental mind-mindedness, ten articles were excluded because the main focus was on the child outcomes of mind-mindedness, nine articles were removed because they consisted of an intervention study, seven articles were removed because mind-mindedness was the independent variable, three studies were removed because mind-mindedness was a moderator in the research design, two studies were removed because they were previously published before August 2017 and already included in McMahon and Bernier (2017), two articles were removed because the studied association was between aspects of mentalization, one study was removed because it focused on the state or trait discussion rather than factors of mind-mindedness ability, and one article was excluded because the study design was a meta-analysis. In this step, a total of 80 articles were excluded.

Finally, the 25 remaining articles were checked for quality by using the study quality assessment tools of the National Heart, Lung, and Blood Institute (2021, see Appendix 1). Four studies were excluded due to a questionable design and low reliability. This led to the final inclusion of 21 studies in this scoping review (Table 2). All phases of exclusion have been stated in the PRISMA flowchart (Figure 1).

Figure 1

Flowchart literature



Descriptive numerical summary

In total, fifteen cross-sectional and six longitudinal studies were included in this review. Of the studies, six have been conducted in Italy, three in the United Kingdom, three in the United States of America, two in Australia, two in Israel, one in China, one in Germany, one in Japan and the United Kingdom, one in Australia and China, and one in Europe. A total of 2605 parents participated in the studies, of which 2149 were mothers and 456 were fathers. The moment parental mind-mindedness was assessed ranged from during the second trimester of pregnancy until when the child was eighteen years of age with a mean of 21.6 months¹ and a median of 7 months. In fourteen studies, mind-mindedness was

¹ From articles that studied MM in parents of children from a particular age range, the mean of the range has been considered in this calculation.

measured by observing interactions between the parents and their infant. In these observations, according to the coding manual of Meins and Fernyhough (2015), proportions of mind-related comments and appropriate and non-attuned comments were determined. Three studies measured mind-mindedness through interviews with parents where they were asked to describe their child, two studies asked parents to describe their child in a survey, and two studies asked parents to describe their relationship with their child in an interview.

Table 2

Data charting form

Nr	Author(s) and year of publication	Title	Study location	Aims of the study	Study Population	Methodology	Results
1	Ansari, McMahon, Bernier (2020)	Parental mind-mindedness: Comparing parents' representations of their children with autism spectrum disorder and siblings	Australia	Explore mind-mindedness in parents of children with autism spectrum disorder (ASD).	Parents who have children with an ASD diagnosis and a typically developing child of comparable age	Cross-sectional, family sibling design. Describe your child task	Parents were less mind-minded with their ASD child than with the typically developing sibling. ASD severity was negatively correlated with appropriate mind-mindedness (MM).
2	Bigelow, Beebe, Power, Stafford, Ewing, Egleson, Kaminer (2018)	Longitudinal relations among maternal depressive symptoms, maternal mind-mindedness, and infant attachment behavior	USA	Explore the relation between previous and current maternal depression risk and MM.	Primiparous mothers with and without depression risk	Longitudinal study. Videotaped interactions	Mothers with higher depression risk at 6 weeks were less appropriately MM, even if depression declined at the moment of MM measurement.
3	Camisasca, Miragoli, Ionio, Milani, Di Blasio (2017)	Post-partum depressive symptoms and child behavior: The mediational role of maternal mind-mindedness	Italy	Examine if postpartum depressive symptoms are associated with MM.	Women (19-39 y.) who just gave birth. Inclusion criteria: knowledge of the Italian language, no amnesia, and a healthy baby	Longitudinal study. Videotaped interactions	No association between postpartum depressive symptoms (T1 and T2) and maternal MM. Negative association between depressive symptoms at T3 and appropriate MM.
4.	Dai, Lim, Xu (2019)	The relations between maternal mind-mindedness, parenting stress, and obstetric history among Chinese mothers	China	Investigating the relation between maternal MM, parenting stress, and obstetric history.	Mothers living in cities from Sichuan, China of children without physical or mental disabilities.	Cross-sectional study. Videotaped interactions	Planned conception positively associated with appropriate mind-related comments for mothers who perceived their

							pregnancy as difficult. Parenting stress negatively correlated to appropriate mind-related comments.
5.	Dai, McMahon, Keow Lim (2020)	Cross-cultural comparison of maternal mind-mindedness among Australian and Chinese mothers	Australia and China	Compare MM in Australian and Chinese mothers. Explore differences in appropriate and non-attuned comments.	Urban Australian mothers and their first-born infants Urban Chinese mothers that approximately match demographic characteristics of the Australian mothers.	Cross-sectional Videotaped interactions	Australian mothers overall made more appropriate mind-related comments than Chinese mothers. Chinese mothers made more non-attuned comments.
6.	Dollberg (2022)	Mothers' parental mentalization, attachment dimensions and mother-infant relational patterns	Israel	Explore the association between prenatal attachment anxiety and avoidance and parental mentalization skills.	Mothers and their 3-months old infant. Inclusion criteria: fluent Hebrew, cohabiting with spouse and carrying one baby	Cross-sectional mixed-methods design Videotaped interactions	More attachment-related anxiety related to less appropriate mind-related comments.
7.	Foley, Devine, and Hughes (2022)	Mind-mindedness in new mothers and fathers: stability and discontinuity from pregnancy to toddlerhood	UK	Examine maternal and paternal mind-mindedness during the first 1,000 days of child development.	Expectant couples Inclusion criteria: first-time parents, expecting one healthy baby, English speaking, no (history with) severe mental illness or substance abuse.	Longitudinal study Interview: describe (the relationship with) your child	Fathers and mothers equally mind-minded during pregnancy. After birth, mothers more mind-minded than fathers.
8.	Fujita, Hughes (2021)	Mind-mindedness and self-other distinction: contrasts between Japanese and British mothers' speech samples	Japan and UK	Compare MM in mothers from Japan and the UK.	Families from Osaka, Hyoggo Prefecture, London, and Cambridgeshire.	Cross-sectional Cross-cultural analysis. Describe (the relationship with) your child	British mothers were more MM than Japanese mothers.
9.	Goffin, Kochanska, (2020)	Children's theory of mind as a mechanism linking parents' mind-mindedness in infancy with children's conscience	USA	Examine MM in mothers and fathers.	Two-parent families of typically developing infants Inclusion criteria: living together, speaking English, not moving away for several years	Longitudinal study, but cross-sectional measure. Videotaped interactions	Mothers produced more MM comments than fathers.
10.	Ierardi, Albizzati, Moioli, Riva Crugnola (2022)	Psychopathological and psychosocial risk profile, styles of interaction and mentalization of adolescent and young mother-infant dyads	Italy	Examine the risk profile of adolescent mothers. Examine MM differences between mothers under	Italian adolescent and young mothers up to the age of 21. Inclusion criteria: Italian language; age 14-21 no	Cross-sectional Video-taped interactions	Young mothers show relatively low levels of MM and produced many non-attuned mind-

				18 and mothers between 18 and 21. Examine if risk factors are predictive for MM.	birth-, and child-related medical complications; first-time mothers. Exclusion criteria: prematurity and twin birth.		related comments.
11.	Kirk & Sharma (2017)	Mind-mindedness in mothers of children with autism spectrum disorder	UK	Explore mind-mindedness in parents of children with ASD.	Mothers with children with a diagnosis of ASD (active on parenting forums)	Cross-sectional study. Within-family sample Online survey (describe your child)	No significant differences in MM in mothers describing ASD children compared to mothers describing non-ASD children Severity of autism unrelated to MM.
12.	Larkin, Hayiou-Thomas, Arshad, Leonard, Williams, Katseniou, Malouta, Marshall, Diamantopoulou, Tang, Mani, Meins (2020)	Mind-Mindedness and stress in parents of children with developmental disorders	UK	Examine the association between parental stress and MM in parents of children with developmental disorders.	Parents of typically developing children, or children with a developmental disorder: ADHD, ASD, Down's Syndrome or 22q11.2 Deletion Syndrome.	Cross-sectional Online survey (Describe your child)	No differences in MM. More negative descriptors for ADHD group. Less positive descriptors for DS and 22q11.2DS group than for the typically developing group
13.	Longobardi, Spataro, Calabro (2022)	Maternal mind-mindedness and communicative functions in free-play and mealtime contexts: stability, continuity, and relations with child language at 16 months	Italy	Examine contextual stability of MM by examining MM during free-play and mealtime.	Mothers from Rome and their children	Cross-sectional study. Videotaped interactions	More appropriate mind-related comments during free-play than during mealtime.
14.	McNamara, Mitchell, Russell, Townsend, Herbert (2021)	Antenatal mind-mindedness and its relationship to maternal-fetal attachment in pregnant women	Australia	Examine if maternal-fetal attachment and MM are associated	Woman receiving outpatient care at Wollongong Hospital Antenatal Clinic Inclusion: attending an antenatal appointment, second trimester, aged 18 or over, and English speaking	Longitudinal study. Phone interview for the antenatal mind-mindedness task	Higher MFA in the second and third trimesters was positively correlated with greater MM in the third trimester. MFA no significant predictor of MM.
15.	Planalp, O'Neill, Braungart-Rieker (2019)	Parent mind-mindedness, sensitivity, and infant affect: implications for attachment with mothers and fathers	USA	Examine a possible association between attachment related problems and parental MM	Families	Longitudinal study. Videotaped interactions	Mothers were significantly more MM than fathers. Mothers (not fathers) MM decreased across early infancy (3-7 months)
16.	Reese, Meins, Fernyhough, Centifani (2019)	Origins of mother-child reminiscing style	Europe	Examine predictors of reminiscing	Mothers and their 8 months old child.	Longitudinal study.	Depressed mothers were less

				style in mothers		Videotaped interactions	appropriately MM than non-depressed mothers.
17.	Riva Crugnola, Ierardi, Canevini (2018)	Reflective functioning, maternal attachment, mind-mindedness, and emotional availability in adolescent and adult mothers at infant 3 months	Italy	Compare MM in adolescent and adult mothers.	Adolescent mothers (15-21) and adult mothers (25-41). Inclusion criteria: no mental or physical illness, infants born full term without organic pathologies	Cross-sectional Videotaped interactions	Adolescent mothers less MM, made more non-attuned comments and less positive comments than adult mothers.
18.	Stephanie, Brigitte (2021)	Various mentalizing concepts in mothers with postpartum depression, comorbid anxiety, and personality disorders	Germany	Investigate association between several mental disorders in parents and parental MM	Mother from outpatient unit of the department of psychiatry, psychotherapy, and psychosomatics Inclusion criteria: current psychiatric diagnosis of a mood disorder, German, child's aged 3-10 months Exclusion criteria: Substance abuse, schizophrenia, or other psychotic disorders, intellectual impairment, and acute suicidality, mentally retarded child	Cross-sectional Videotaped interactions	Non-attuned mind-related comments negatively correlated with comorbid PD. No association between non-attuned comments and comorbid BPD.
19.	Suttora, Salerni, Selvagno, Porro, Gangi, Squarza, Gardon, Picciolini (2021)	Mind-mindedness and parenting stress in mothers of preterm and full-term infants: the moderating role of perceived social support	Italy	Examine effects of maternal childbirth-related trauma, on parental MM	Italian mothers. Inclusion criteria preterm (PT) infants: lower weight than 1500g, gestational age <33 weeks at birth. Exclusion criteria PT infants: Genetic abnormalities, Severe neurofunctional impairment, and/or neurosensory disabilities	Cross-sectional Videotaped interactions	Childbirth-related posttraumatic stress and parenting stress showed no direct effects on maternal MM
20.	Suttora, Spinelli, Aureli, Fasolo, Lionetti, Picciolini, Ravasi, Salerno (2020)	Mind-mindedness and parenting stress: a cross-sectional study in a cohort of mothers of 3-month old full-term and pre-term infants	Italy	Explore association between preterm birth and parental MM.	Preterm and full-term infants and their mothers Inclusion criteria preterm infant: gestational age between 25 and 37 weeks at birth. Exclusion criteria for all: Genetic abnormalities,	Cross-sectional study Videotaped interactions	Preterm birth had no significant effects on MM.

					severe neurofunctional impairments, severe neonatal complications and/or neurosensory abnormalities, and no informed consent		
21.	Yatziv, Kessler, Atzaba-Poria (2020)	When do mother's executive functioning contribute to their representations of their child's mind? A contextual view on parental reflective functioning and mind-mindedness	Israel	Explore association between executive functions and parental MM.	Families of children born preterm and full-term.	Cross-sectional Videotaped interactions	No significant association between executive functions and MM.

Themes

Table 3 provides an overview of the thematical framework followed in the results.

Contextual factors

Culture. Most of the included studies were conducted in Western countries. Only two studies explored cross-cultural differences in mind-mindedness (Dai et al., 2020; Fujita & Hughes, 2021). The goal of the first study was to compare parental mind-mindedness ability in mothers from urban Australian areas and mothers from mainland China with similar demographics (Dai et al., 2020). After controlling for maternal education and verbosity, Australian mothers made more comments overall during free play with their 19-month-old child. Furthermore, they made more appropriate mind-related comments and less non-attuned mind-related comments than Chinese mothers. Transcript analysis showed that Australian mothers made more comments about their child's desires and preferences than Chinese mothers. The second study compared mind-mindedness in British and Japanese mothers (Fujita & Hughes, 2021). Participants were asked to describe their 3 to 6-year-old child. The results showed that British mothers spoke more overall, but after controlling for the total amount of comments and maternal education, British mothers also made significantly more mind-related comments compared to Japanese mothers.

Interactional context. A single study considered the differences in maternal mind-mindedness during observed free play versus mealtime contexts with 16-month-old infants (Longobardi et al., 2022). The aim was to investigate the contextual stability and the contextual continuity of mind-mindedness and thus if mind-mindedness in one context could predict mind-mindedness in another context. The results showed that mind-mindedness was

not stable across contexts. Appropriate mind-related comments were more frequent during free play than during mealtime.

Personal factors

Parent's stress. Two studies have been conducted on the association between parental stress and mind-mindedness (Dai et al., 2019; Suttora et al., 2021). One study examined the relationship between parenting stress (i.e., perceiving parenting as stressful) and mind-mindedness in a sample of mothers with their infant (mean age of 16 months) by observing mother-child interactions (Dai et al., 2019). A significant negative correlation between parental stress and appropriate mind-related comments was found when controlling for maternal education and income (Dai et al., 2019). However, parental stress did not have a direct effect on appropriate mind-related comments. The second study aimed to investigate the effects of childbirth-related posttraumatic stress and parental stress on maternal mind-mindedness by observing mother-infant interactions at the child's age of 6 months (Suttora et al., 2021). No direct effects of childbirth-related posttraumatic stress and parental stress on maternal mind-mindedness were found.

Parent's psychopathology. Four articles explored the association between a parent's psychopathology and mind-mindedness (Bigelow et al., 2018; Camisasca et al., 2018; Reese et al., 2019; Stephanie & Brigitte, 2021). The aim of the first article was to assess the association between current and previous maternal self-reported depression risk and maternal mind-mindedness in a longitudinal design (Bigelow et al., 2018). Depression risk was measured at 6 weeks, 4 months, and 12 months postpartum, and mind-mindedness was measured at 4 months of child age by observing face-to-face interactions between mother and child. Mothers who were at risk of depression at 6 weeks postpartum made less appropriate mind-related comments, even if the depression risk had declined at 4 months. No differences were found in non-attuned comments. A second study examined the association between maternal depressive symptoms and maternal mind-mindedness (Reese et al., 2019). This longitudinal study also found a negative association between maternal depressive symptoms and maternal mind-mindedness. Mothers who had depressive symptoms at 8 months postpartum made fewer appropriate mind-related comments to their infant. The third article aimed to advance knowledge on the association between maternal depressive symptoms and mind-mindedness by performing a longitudinal study (Camisasca et al., 2018). This study measured depressive symptoms in the first days after birth with a mean of 87 hours, at 3 months, and 17 months postpartum. Maternal mind-mindedness was measured at 17 months by observing free play sessions of mother and child. They found that depressive symptoms at

17 months were negatively associated with maternal mind-mindedness measured at the same time. Earlier maternal depressive symptoms (87 hours and 3 months post-partum) were not significantly associated with mind-mindedness.

Child's psychopathology. Three studies investigated a possible association between a child's psychopathology and parental mind-mindedness (Ansari et al., 2020; Kirk & Sharma, 2017; Larkin et al., 2021). In a within-family sibling design, parents were asked to describe their child with ASD and a sibling without ASD, both aged between 5 and 12 years old (Ansari et al., 2020). It was demonstrated that parents used fewer mental state words for their child with ASD than for the typically developing sibling. In addition, they found that parents of children with more severe ASD used fewer mental state words than parents of children with mild ASD. The aim of the second study was to examine mind-mindedness in mothers of children with ASD with a mean age of 5.5 years old (Kirk & Sharma, 2017). In an interview, mothers were asked to describe their child. The study found no significant difference in the amount of mind-related comments when describing the child with ASD compared to their typically developing sibling. In addition, this study found no link between the severity of ASD and the mother's use of mental state descriptors. However, it was found that mothers used more positive mental state descriptors for children without ASD, whereas more negative descriptors were used for their child with ASD. Finally, one study aimed to investigate the association between multiple developmental disorders and parental mind-mindedness (Larkin et al., 2021). Mind-mindedness was assessed by asking parents to describe their children with developmental disorders (ADHD, ASD, Down's Syndrome, 22q11.2 Deletion Syndrome) and typically developing children, all aged two to 18 years. They found that parents of children with ADHD, Down's Syndrome, ASD, and 22q11.2 Deletion syndrome overall were equally mind-minded in terms of the frequency of mind-related descriptors compared to parents of typically developing children. However, parents of children with ADHD used more negative descriptions of their children, and parents of children with 22q11.2 Deletion Syndrome used significantly less positive (but not more negative) mental descriptions than parents of the typically developing group.

One study examined the association between mental disorders and mind-mindedness during free play, diaper change, and book-sharing episodes between mothers and their 3-10 months old infant (Stephanie & Brigitte, 2021). This showed that non-attuned comments were not related to postpartum depression and comorbid bipolar personality disorder. However, a significant positive correlation was found between non-attuned mind-related

comments and obsessive-compulsive personality disorder. Finally, they found that non-attuned mind-related comments were negatively correlated with personality disorders.

Parent's age. Two studies reported on the association between maternal age and mind-mindedness (Ierardi et al., 2022; Riva Crugnola et al., 2018). The aim of the first study was to compare mind-mindedness in adult mothers (aged 25 to 41 years) and adolescent mothers (aged 15 to 21 years) by observing the interactions between the mothers and their 3-month-old infant (Riva Crugnola et al., 2018). They demonstrated that compared to adult mothers, adolescent mothers were more insecure and made fewer appropriate mind-related comments. The second study aimed to identify a risk profile of adolescent mothers, to assess differences between adolescent mothers (aged under 18 years) and young mothers (aged 18 to 21 years), and to examine which risk factors were predictive for lower mind-mindedness in interactions between mothers and their 3-month-old infant (Ierardi et al., 2022). The authors demonstrated no significant differences in mind-mindedness between adolescents and young mothers. Adolescent and young mothers both showed a low level of mind-mindedness, expressed few mental-state comments, and had high levels of non-attuned comments.

Parent's gender. Three articles explored the association between parental gender and parental mind-mindedness (Foley et al., 2022; Goffin et al., 2020; Planalp et al., 2019). All studies showed that mothers were generally more mind-minded with their infants than fathers. The aim of the first study was to examine maternal and paternal mind-mindedness during the first 1000 days of the child's development (Foley et al., 2022). Parents were asked to describe their (future) child and their relationship with their (future) child in an interview conducted during the third trimester and 4-, 14-, and 24 months after birth. During pregnancy, expectant mothers and fathers showed equal levels of mind-mindedness. In the period from the last trimester of pregnancy to 24 months postpartum, both mothers and fathers showed an increase in mind-mindedness. However, the increase in mind-mindedness was larger among mothers than fathers. The gains in mind-mindedness of fathers were stronger with daughters than with sons and in the context of infant surgency. In the second year of life, mind-mindedness increased more strongly in case of high levels of both SES and father involvement in childcare. The second study aimed to investigate mind-mindedness in both mothers and fathers in a cross-sectional design, where mind-mindedness was measured at the child's age of 7 months (Goffin et al., 2020). They found that mothers produced more mind-related comments than fathers. Also, they found that fathers produced less appropriate mind-related comments during play context with girls than with boys. The third study aimed to investigate how parents reflect on their infants' mental states by observing parent-child

interactions at the child age of 3-, 5-, and 7 months old (Planalp et al., 2019). They showed that mothers used significantly more mind-related comments (both appropriate and non-attuned) than fathers. However, in contrast to Foley et al. (2022), maternal mind-mindedness decreased during early infancy (3-7 months), a trend that was not seen in fathers.

Parent's attachment. Two studies examined the association between parents' own attachment style and their mind-mindedness ability (Dollberg, 2022; Riva Crugnola et al., 2018). The aim of the first study was to assess the association between attachment and parental mind-mindedness in adult (25 to 41 years) and adolescent mothers (aged 15 to 21 years) by observing interactions between mothers and their 3-month-old infants (Riva Crugnola et al., 2018). The Adult attachment interview (AAI) is a measure to explore a person's relationship with their parents when they were children. The Mother Idealizing and Lack of Memory AAI subscales, which could be considered indicators of dismissive attachment, revealed a positive association with non-attuned mind-related comments. In addition, the Father Anger AAI subscale, which is considered an indicator of preoccupied attachment, revealed an association with negative mind-related comments. The second study aimed to investigate antecedents and correlates by observing mothers and their 3-month-old infant (Dollberg, 2022). They showed that women with higher levels of attachment anxiety during pregnancy showed significantly less appropriate mind-related comments in parent-child dyads.

Parent's cognitive capacities. One article explored associations between the executive functions of parents and mind-mindedness in mothers with their 66-month-old preschool child by asking mothers to describe their child (Yatziv et al., 2020). Executive functions enable goal-directed controlled behavior, including three main functions: working memory, inhibition, and shifting, which were tested by having mothers perform computerized executive functioning tasks. No associations were found between parents' executive functions and mind-mindedness.

Parenting-related factors

Pregnancy and birth. Three studies discussed the association between pregnancy and birth conditions on the one hand and parental mind-mindedness on the other hand (Dai et al., 2019; Suttora et al., 2020, 2021). One study aimed to examine relations between mind-mindedness, parenting stress, and obstetric history in mothers, by observing interactions between the mother and their child (mean age 16 months) (Dai et al., 2019). They showed that the interaction between planned conception and perceiving the pregnancy as difficult was positively associated with appropriate mind-related comments. A parent's first contact with

their newborn was not associated with appropriate and non-attuned mind-related comments. The second study aimed to examine the relation between preterm birth and parental mind-mindedness by observing interactions between mothers and their 3-month-old infant (Suttora et al., 2020). No direct effect of preterm birth was found on maternal mind-mindedness. However, when mothers with preterm babies also experienced high parenting stress, lower levels of non-attuned comments were observed. The final study aimed to examine the effects of preterm birth and maternal childbirth-related posttraumatic stress and parenting stress on mind-mindedness (Suttora et al., 2021). Mind-mindedness was measured by observing interactions between mothers and their 6-month-old children. Perinatal PTSD and parenting stress related to preterm birth did not show significant effects on maternal mind-mindedness.

Maternal-fetal attachment. One study aimed to explore the association between maternal-fetal attachment and antenatal mind-mindedness (McNamara et al., 2022). During the second and third trimesters, pregnant women filled in the Maternal-Fetal Attachment Scale (MFAS). During the third trimester, the Antenatal Mind-mindedness Task was performed through a phone interview. Results showed that higher MFA scores in the second and third trimesters were positively correlated with greater mind-mindedness scores. However, in a regression analysis, MFA scores were no significant predictors of maternal mind-mindedness.

Table 3*Thematical framework*

Main theme	Subtheme	References	Results
Contextual factors	Culture	(Dai et al., 2020; Fujita & Hughes, 2021)	Culture is significantly associated with parental mind-mindedness ability.
	Interactional context	(Longobardi et al., 2022)	Interactional context seems to influence parental mind-mindedness ability.
Personal factors	Parents' stress	(Dai et al., 2019; Suttora et al., 2021)	Mixed findings. Negative correlation between parental stress and mind-mindedness (Dai et al., 2019), but no direct effect of stress on mind-mindedness (Dai et al., 2019; Suttora et al., 2021).
	Parent's psychopathology	(Bigelow et al., 2018; Camisasca et al., 2018; Reese et al., 2019; Stephanie & Brigitte, 2021)	Mixed findings. Some studies demonstrated negative associations between maternal depression and appropriate mind-mindedness ((Bigelow et al., 2018; Camisasca et al., 2018; Reese et al., 2019), while one study found no association (Stephanie & Brigitte, 2021).
	Child's psychopathology	(Ansari et al., 2020; Kirk & Sharma, 2017; Larkin et al., 2021)	Mixed findings. One study found that having a child with ASD was associated with lower parental mind-mindedness (Ansari et al., 2020), while other studies found no significant difference for children with ASD (Kirk & Sharma, 2017) and other developmental disorders (Larkin et al., 2021).
	Parent's age	(Ierardi et al., 2022; Riva Crugnola et al., 2018)	Significant associations were found between parent's age and mind-mindedness ability.
	Parent's gender	(Foley et al., 2022; Goffin et al., 2020; Planalp et al., 2019).	Mothers were significantly more mind-minded than fathers.
	Parent's attachment	(Dollberg, 2022; Riva Crugnola et al., 2018)	Significant results were found for an association between dismissive attachment and attachment anxiety and parental mind-mindedness.
	Parent's cognitive capacities	(Yatziv et al., 2020)	No significant association between parent's executive functions and mind-mindedness.
Parenting-related factors	Pregnancy and birth	(Dai et al., 2019; Suttora et al., 2020, 2021)	Mixed findings. Planned conception was positively associated with appropriate mind-related comments for mothers who

		perceived their pregnancy as difficult (Dai et al., 2019). No effects of preterm birth conditions (Suttora et al., 2020, 2021).
Maternal-fetal attachment	(McNamara et al., 2022)	No significant results were found for an effect of maternal-fetal attachment on parental mind-mindedness ability.

Discussion

This scoping review examined the association between contextual, personal, and parenting-related factors and parental mind-mindedness ability. The aim of this study was to build upon the previous literature review by McMahon and Bernier (2017), by examining: (1) *What has been published since 2017 about contextual, personal, and/or parenting-related factors that potentially contribute to individual differences in parental mind-mindedness ability?* and (2) *Which contextual, personal, and/or parenting-related factors can be reliably identified, based on the available literature, as contributing to parental mind-mindedness ability?*. In this scoping review, 21 studies were included, of which some studies focused on multiple factors. Sixteen articles focused on the association between personal factors and mind-mindedness. Four studies on parenting-related factors and three studies on contextual factors were included. Based on the findings of these included studies, potential associations were demonstrated between culture, parent's age, parent's gender, maternal depression, parent's attachment, child's psychopathology, and planned pregnancy and experience of the pregnancy and parental mind-mindedness ability.

Since the introduction of the term 'mind-mindedness' in 1997, the topic has gradually received more attention in scientific research, and knowledge of the construct has increased in previous years. In their comprehensive 2017 review, McMahon and Bernier recommended expanding the knowledge on mind-mindedness in different cultures, in fathers and childcare workers, in atypical parental contexts (adopting/fostering), and in children with developmental disabilities (e.g. deaf children). This scoping review demonstrated that various new articles have been published on mind-mindedness in different cultures, paternal mind-mindedness, and in children with developmental disabilities. No articles were found on the association between parental mind-mindedness and atypical parental contexts. So even though a lot of new evidence was found on possible associations with mind-mindedness, research is still at an early stage.

The second research question aimed to identify contextual, personal, and/or parenting-related factors that contribute to parental mind-mindedness ability. The first factor that was

repeatedly identified in the included studies is culture (Dai et al., 2020; Fujita & Hughes, 2021). Asian mothers (China and Japan) were less appropriately mind-minded than non-Asian mothers (Australia and the United Kingdom). This corroborates previous research demonstrating that culture is associated with mind-mindedness (Hughes et al., 2017; Wang et al., 2017). A possible explanation for this repeated finding is that Asian mothers generally have different socialization goals than Western mothers (Wang, 2007). The Asian cultures are more collectivistic, and the emphasis is more on relational hierarchy and social conformity, while the Western emphasis is more on the development of individuality and autonomy in a child. This supports the idea of Fujita and Hughes (2021) that parents from more individualistic cultures are generally more mind-minded than parents from collectivistic cultures. Additionally, maternal age was repeatedly identified as associated with mind-mindedness (Ierardi et al., 2022; Riva Crugnola et al., 2018), which corroborates previous research (Camberis et al., 2016; Meins et al., 2013). This supports the idea that older mothers are more psychologically mature, which is associated with more adaptive parenting resulting in more mind-minded interactions between mother and infant (Camberis et al., 2016). Both culture and maternal age can be reliably identified as contributing to parental mind-mindedness ability and are therefore possible targets for intervention.

Research demonstrated promising outcomes on associations between several factors and parental mind-mindedness, but additional research is required before firm conclusions can be drawn. The first promising factor is the parents' gender. It was demonstrated that mothers were more mind-minded in comparison to fathers (Foley et al., 2022; Goffin et al., 2020; Planalp et al., 2019). The 2017 review of McMahon and Bernier did not cover any studies on parental gender differences in mind-mindedness. Since mothers generally are more involved in (early life) childcare and have more interaction with the child than fathers, a possible explanation for this gender difference is relationship closeness (Meins et al., 2014). Additional research is required to establish if gender differences in parental mind-mindedness reflect differences in parental involvement rather than an effect of parent gender (Foley et al., 2022). This is important since lower mind-mindedness in both mothers and fathers can be a risk factor for lower social competence and more externalizing problems in early childhood (Colonnesi et al., 2019). Also, children exposed to more paternal mind-mindedness showed fewer executive functioning problems in school (Regueiro et al., 2022). In improving mind-mindedness in fathers, parents can be educated on the individual effects mind-mindedness in mothers and fathers have on the development of their children. Second, three out of four studies found negative associations between maternal depression and appropriate mind-

related comments (Bigelow et al., 2018; Camisasca et al., 2018; Reese et al., 2019). Depression tends to be accompanied by irritability, fatigue, intrusion, self-focus, and social withdrawal, which could influence a mother's ability to tune into their infant's mental state (Bigelow et al., 2018). Previous research demonstrated no consistent outcomes on this association (McMahon & Bernier, 2017). All included studies showing negative associations had a longitudinal design, which could be a strong indication that maternal depression and mind-mindedness ability are associated. However, the included studies demonstrated that associations between maternal depression and mind-mindedness were not significant at every measure point, and studies found no consistent results on at what timepoint maternal depression and mind-mindedness are significantly associated. It is recommended to explore if other factors are of influence in the association between maternal depression and mind-mindedness, which could be a cause for this discrepancy. Third, it was demonstrated that dismissive attachment and attachment anxiety in parents were associated with a lower mind-mindedness ability (Dollberg, 2022; Riva Crugnola et al., 2018). This does not corroborate previous research, which did not find an association between parents' attachment and mind-mindedness (Hill & McMahon, 2016). The included studies measured mind-mindedness by observing parent-child dyads, while the study of Hill and McMahon (2016) measured mind-mindedness by using an online questionnaire. It has not yet been proven that the different measures capture the exact same construct (McMahon & Bernier, 2017), which could be an explanation for this discrepancy. Also, the observational measure is mostly used for children until 18 months, while the interview measure is appropriate for preschool children, therefore, the child's age could also be of influence. Fourth, one study found an association between a child's ASD diagnosis and parental mind-mindedness (Ansari et al., 2020), while two studies found no association between a child's psychopathology and parental mind-mindedness (Kirk & Sharma, 2017; Larkin et al., 2021). However, Kirk and Sharma (2017) found no differences in parental mind-mindedness for children with ASD and typically developing children, but did describe in their discussion that the non-significant association between ASD severity and negative mental state descriptors could reach significance if a larger sample was used with medium effect sizes. A child's psychopathology potentially influences parental mind-mindedness, especially in the interview measure, since parents might focus more on the child's diagnosis-related behavior than on the child's mental states (Ansari et al., 2020). No research on this subject was covered by McMahon and Bernier (2017), which indicates that research on this factor is relatively new. Finally, some pregnancy and birth-related factors demonstrated an association with parental mind-mindedness (Dai et al., 2019).

Planned conception was positively associated with appropriate mind-related comments for mothers who perceived their pregnancy as difficult (Dai et al., 2019), which is partially in line with previous research. Meins et al (2011) stated that planned pregnancy is associated with appropriate mind-related comments and that mothers who perceived their pregnancy as easy were more mind-minded than mothers who perceived their pregnancy as difficult. However, studies were conducted in different cultures (Asian vs. Western), which could explain the contrast. Mothers from Asian cultures are more likely to adopt a 'sick role' while being pregnant than mothers from Western countries, even when they planned to conceive, which could cause the interaction between the perception of pregnancy and planned pregnancy (Dai et al., 2019).

Research demonstrated that some factors are not likely to contribute to parental mind-mindedness ability. It was found that parental stress does not influence mind-mindedness (Dai et al., 2019; Suttora et al., 2021), even when parental stress and mind-mindedness were negatively correlated (Dai et al., 2019). Previous research demonstrated it is more likely that parental stress is influenced by mind-mindedness ability since the inability to understand the internal states of a child could be experienced as stressful (McMahon & Meins, 2012). Second, higher MFA scores were positively correlated with mind-mindedness, but no direct effect of MFA was found on mind-mindedness (McNamara et al., 2022). This is not in line with previous research, which showed a direct effect of MFA on mind-mindedness (McMahon et al., 2016). This discrepancy could be a result of different measures, with interviews for the included study and observations for the previous study. However, based on the included study, MFA is not likely to contribute to parental mind-mindedness ability. Finally, some parental and pregnancy-related characteristics showed no association with parental mind-mindedness, such as parents' executive functions (Yatziv et al., 2020), preterm birth, perinatal PTSD, and parenting stress related to preterm birth (Suttora et al., 2020, 2021). These topics were not covered by McMahon and Bernier (2017) and therefore are unlikely to be contributing to parental mind-mindedness ability.

Finally, some subjects were proven to be underresearched. The first factor that was underresearched is interactional context, which was exclusively studied in one article with a cross-sectional character and a small sample (n=25). The effect of interactional context was examined by comparing parental mind-mindedness in two different settings: playtime and mealtime, which showed that parents were more appropriately mind-minded during free play than during mealtime (Longobardi et al., 2022). Since mealtime can be considered more stressful than playtime, this could be a first indication that parents are less appropriately

mind-minded in stressful situations. Longobardi et al (2022) were the first to examine mind-mindedness in parent-child dyads with the same child in different interactional contexts. Given the small sample and the design of the study, this factor could be considered under-researched. Further, a subject that was recommended for future research by McMahon and Bernier (2017) was parenting in atypical contexts, such as adoption and fostering. However, no studies were found that investigated an association between adoption/fostering and parental mind-mindedness ability. Hence, it is recommended to increase understanding of the effects of these factors on parental mind-mindedness ability.

This scoping review has several limitations that should be considered. The first and most important limitation is that the research included in this review cannot determine causal relationships between the contextual, personal, and parenting-related and parental mind-mindedness ability. To determine causal relationships, experimental research must be conducted. However, this is generally not possible in behavioral and social sciences due to ethical reasons. In this scoping review, most of the included articles used a cross-sectional design, which limits the understanding of effects on mind-mindedness rather than correlations. To explore the predictive effects of factors on mind-mindedness, longitudinal studies are more suitable. Second, over half of the studies included reported having limited sample sizes, which limits power. Therefore, representativeness cannot be guaranteed, and larger samples are required to confirm the results. Third, Levac et al. (2010) stated that articles should be reviewed by a minimum of two researchers to maximize the chance of an objective selection of articles. This scoping review has been conducted individually which increases the risk of bias. To minimize this risk, the process of inclusion and exclusion of articles has been documented carefully. Finally, references were retrieved through a handful of electronic databases, although the recommended search strategy includes searching literature in electronic databases, reference lists of articles, by hand-searching key journals, and through existing networks, organizations, or conferences (Arksey and O'Malley, 2005). In this review, therefore, it cannot be guaranteed that all relevant literature from the past five years was included.

Based on this review, recommendations for research and practice were established. This review found many factors that potentially are associated with mind-mindedness. Future research is warranted for factors that may be contributing to mind-mindedness but have been under-researched and/or demonstrated inconsistent results. Since parental mind-mindedness has a positive influence on the child's development (Laranjo et al., 2014; Lundy & Fyfe, 2016; Meins et al., 2003; Meins & Fernyhough, 1999), it also is recommended to apply

interventions to groups that naturally are less likely to be mind-minded. For example, the *BabyMind* app is an intervention that facilitates maternal attunement to their infants' mental states and encourages parents to view the world from their child's perspective. An evaluation of the intervention showed that the app significantly increased mind-mindedness and was equally effective for younger and older mothers (Larkin et al., 2019). Research included in this review, as well as previously published literature, repeatedly demonstrated that younger mothers were less mind-minded than older mothers (Ierardi et al., 2022; Riva Crugnola et al., 2018). While parents' age is a factor that cannot be influenced, the *BabyMind* app is an example of an easily accessible intervention that can be used to educate and support young mothers to enhance their mind-mindedness ability.

Although research on mind-mindedness has increased in the last five years, only a small subsample concerns the identification of potential predictive factors of variation in parental mind-mindedness ability. In many areas, more research is needed to be able to draw firm conclusions, however, based on the findings of this review, and in line with earlier publications, robust evidence was found for culture (Dai et al., 2020; Fujita & Hughes, 2021) and maternal age (Ierardi et al., 2022; Riva Crugnola et al., 2018) being predictive factors for parental mind-mindedness ability. Future research can focus on promising and understudied factors, preferably with larger samples in longitudinal designs to increase the chance of finding robust evidence. Interventions can be applied to parents who naturally have a lower tendency to be mind-minded, such as young mothers and parents from more collectivistic cultures, which may in turn benefit the development of their children.

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