The association between maternal mindful parenting and general intelligence in four-year-olds

Author: Demi Brugel

Supervisor: M.I. Van den Heuvel

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Department of Developmental psychology, University of Tilburg

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Abstract

Mindful parenting has consistently shown to have a positive outcomes on children. However, little is known about the association between mindful parenting and intelligence in children. The aim of this study was to examine the association between maternal mindful parenting and general intelligence in four-year-old children. Mindful parenting was measured using the Interpersonal Mindfulness in Parenting scale (IM-P). General intelligence in the child was measured with the SON-R 2½-7 mosaic task, which is a spatial and performance test and the category task which is a reasoning test. The data was analyzed with the help of six multiple linear regression analyses. Covariates that were taken into account were the level of education of the mother, the number of siblings the child has and the gender of the child. A positive effect of the total score on the mindful parenting questionnaire on the SON-R mosaic task was found (p= .03). This result suggests that a higher level of mindful parenting is associated with higher general intelligence in four-year-olds. Giving parents mindfulness interventions could be beneficial for the children.

Keywords*:* mindful parenting; general intelligence; spatial cognition; children; preschoolers; cognitive development

Introduction

The way a child is raised can be an important factor influencing the later development of the child. A negative way of parenting could lead to negative outcomes for a child. For example, Rhee et al. (2006) found that compared to the children of authoritative mothers, the children of authoritarian mothers had a higher risk of being overweight in the first grade. The children of permissive and neglectful mothers also had a two times bigger risk of being overweight compared to children of authoritative mothers. There are certain ways you could raise your child and there are many theories about what the best way of parenting is. Baumrind (1966) was the first person who talked about the permissive-, authoritarian- and the authoritative parenting styles. These parenting styles are now widely known and studied.

The permissive parenting style is a parenting style which includes a lot of warmth. The parent is acceptant towards the child's wishes and actions. There are no strict rules, the parent is a resource for the child. A parent is used to fulfill the child's wishes. Thus, this kind of parenting is characterized by warmth and love but the parent is not a real authority. A parent tries to use reason and manipulation to stimulate the child to do certain things, but uses no power to do so. Therefore the child is given a lot of autonomy, even though this might not fit the child's age (Baumrind, 1966).

The authoritarian parenting style is, in contrast to the permissive parenting style, a very strict way of parenting. An authoritarian parent uses rules and control to manipulate the behavior of his or her infant, there is an absolute standard and there is no room for discussion. Obedience is something that is greatly valued by the parent. In contrast to the permissive parenting style, the child is not autonomous in the authoritarian parenting style (Baumrind, 1966).

Baumrind's third parenting style is the authoritative parenting style. This parenting style combines warmth and authority. An authoritative parent tries to direct the child's actions but does this in a rational way. This type of parent encourages the child to dialogue, but there are boundaries. There are rules but they are not as strict as the rules in the authoritarian parenting style. The authoritative parent recognizes his child's qualities and talents but also tries to set some future standards, so the child can develop his or her full potential. In the authoritative parenting style, the child will get a level of autonomy fitting to his or her age.

Baumrind (1991) states that the best parenting style is the authoritative style. In a study was found that, maternal authoritative parenting can be related to higher self-esteem,

higher life satisfaction and to lower depression in adolescents (Milevsky, Schlechter, Netter, & Keehn, 2008). Too much control and authority could lead to the child being dependent of the parent. Or on the contrary, too much control could lead to rebellion of the child (Baumrind, 1991). In the permissive way of parenting, a non-interfering parent could increase the chance of re-occurrence of an unacceptable action performed by the child (Baumrind, 1966) In a study was found that permissiveness in the parent can increase the level of aggression, nursery school boys show to younger boys (Siegel & Kohn, 1959). Jago et al. (2011) found that permissive parent can lead to higher physical activity in children, compared to the authoritative parenting style. Thus, the different parenting styles can have different effects on the child, both positive and negative.

A recently developed parenting style is mindful parenting. Mindful parenting is a framework in which the concept of mindfulness is applied to parenting (Duncan, Coatsworth, & Greenberg, 2009). Mindfulness is defined as "the awareness that emerges through paying attention, on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn 2003, p. 145). There are a number of studies about mindfulness that show that it can have multiple positive effects. For example, in a recent study was found that a higher level of mindfulness can be associated with better cardiovascular health (Loucks, Britton, Howe, Eaton, & Buka, 2014). Allen and Kiburz (2012) found that parents who scored higher on the Mindfulness Attention Awareness scale (MAAS), report greater work-family balance, better sleep quality and greater vitality.

The concept of mindful parenting consists of five dimensions: (1) the parent listens to his or her child with full attention. (2) in the parent-child relationship we can speak of non-judgmental acceptance of self and child. (3) there is emotional awareness of self and child. (4) there is self-regulation in the parenting relationship. (5) compassion for the self and for the child (Duncan et al., 2009). Parents high on mindful parenting deliberately try to bring purposeful awareness to parenting situations to deepen the parent-child connection (https://mindfulparenthappychild.com). Research on the effect of mindful parenting on a child is scarce.

In one study three mothers of a child with autism were trained in mindful parenting (Singh et al., 2006). All mothers already tried some other parenting training programs such as behavior management or medication management (Singh et al., 2006). Three behaviors were observed in the three children with autism: aggression, non-compliance and self-injury. The mothers were asked to answer questions of three subjective measures, with one of them being

a measure of mindfulness in parenting. This study was conducted in three phases: the baseline phase in which no training was given and the mothers were asked to parent the same way as they did before the study, the training phase in which the mothers were learned some of the mindful parenting techniques and the practice phase in which the mothers were asked to uphold the mindful way of parenting for a duration of 52 weeks (Singh et al., 2006). The levels of aggression, non-compliance and self-injurious behaviors decreased noticeably. Although there was already a decline in the transition from the baseline to the training phase, the biggest decrease was found in the transition from the training phase to the practice phase. For example, the level of aggression in the child of the first mother decreased with 16 percent in the training phase, in the practice phase the level of aggression decreased further with 88 percent (Singh et al., 2006). Besides the decreases in the negative behaviors in the children, mindful parenting had some other positive effects. First of all, the mothers reported higher parental satisfaction after the training and practice phase. Secondly, the satisfaction with the mother-child interaction increased further over the phases (Singh et al., 2006). Hence, it was found that mindful parenting can be associated with decreases in non-beneficial behaviors, increases in parental satisfaction and increases in mother-child interaction satisfaction in mothers with an autistic child. However, because the child participants all had autism, the findings of this study cannot be generalized to the whole population of children. It could be that mindful parenting has a different effect on children without this disorder. Also, there were only three mothers and three children who participated in this study, a larger sample could give more certainty about the findings.

In another study 86 parents received mindful parenting training. All the parents had one child that received mental health care, this child was also the targeted child. In this study child psychopathology, parent psychopathology, parental stress, co-parenting and marital conflicts were measured (Bögels, Hellemans, Van Deursen, Römer, & Van der Meulen, 2013). After the mindful parenting intervention there were less internalizing behaviors found in the children, also there was a reduction in externalizing problems. To look at the importance of the improvements in the symptoms of the children, due to mindful parenting, they calculated the percentage of children who were above the clinical threshold (Bögels et al., 2013). Before the intervention the percentage for internalizing behaviors was 59 and for externalizing 63, after the intervention these percentages were respectively 39 and 43. Because only children with mental problems were studied, these findings cannot be generalized to the whole population.

The results of those studies suggest that mindful parenting is associated with decreases in problem behaviors and decreases in symptoms of mental problems. Mindful parenting was also associated with higher parental satisfaction but also with a higher satisfaction of the mother-child interaction. This interaction is very important because, a negative atmosphere between the mother and child can cause emotional problems. The question is: Can mindful parenting also be associated with better developmental outcomes in children?

Bennet, Bendersky, & Lewis (2011) studied the relation between parenting dimensions and emotional knowledge in children, he found that parental warmth, which possibly could be associated with the compassion and non-judgmental acceptance in mindful parenting, correlates with emotional knowledge in children. Parental warmth was observed during free play when the child was two years old. At the age of four, the parental warmth was measured with the Warmth and Acceptance subscale from the Home Observation for Measurement of the Environment (HOME). To assess the emotional knowledge of the child, they looked at the labelling of expressions, recognition of expressions and situational knowledge. Hence, the results of this study suggest that a mindful way of parenting might lead to a child having a higher level of emotional intelligence.

Could mindful parenting also have an effect on general intelligence in children? There are some different theories about what intelligence is. Neisser et al. (1996) state that intelligence is a complex set of phenomena. This complex set contains the ability to understand complex ideas, to adapt efficiently to the environment, to engage in various forms of reasoning and to overcome obstacles by taking thought (Neisser et al., 1996). Someone's intellectual performance can be effected by different factors and therefore will not always be the same (Neisser et al., 1996).

Some psychologists believe that there are different kinds of intelligences. Gardner is one of those psychologists, he invented the theory of multiple intelligences. Gardner believed that there are seven kinds of intelligence, namely: linguistic, musical, visual-spatial, body-kinesthetic, interpersonal, logical-mathematical and intrapersonal (Gardner, 1985). Gardner believes that in the intelligence tests, only linguistic, logical and a little bit of spatial are assessed and therefore, these tests cannot be seen as an adequate way to measure intelligence. The mostly used measure for general intelligence is the g factor, this factor consists of positive correlations between cognitive abilities and was invented by Charles Spearman. Spearman believed that general intelligence could be tested and that intelligence could be expressed in a score, which is now widely known to us as the IQ-score. It could be that

mindful parenting has an effect on the development of one of those cognitive abilities, Spearman believed are a part of general intelligence.

The current study

In the studies that are previously discussed, the effects of mindful parenting on children were studied. In the study of Singh et al. (2006) and in the study of Bögels et al. (2013) the children had autism or other mental problems. In this study a larger sample of healthy four-year-old children will be used. Also, these are studies that looked at the behaviors a child shows, but what is the effect of mindful parenting on cognitive factors? This will be the first study that will investigate the association between maternal mindful parenting and cognitive development in four-year-olds. In most cases the child sees his or her mother more often than the father and therefore, this study will focus on mindful parenting in the mother. In this study the following question will be investigated: ”Does maternal mindful parenting influence the development of general intelligence in four-year-old children?” The hypothesis in this study, that will be tested is: “A higher score on mindful parenting is associated with a better performance of the four-year-old on the intelligence tests”.

Methods

The current study was part of a longitudinal study named the BrainAGE-project, a project that is additional to the PELS-project. In the PELS-project, a number of women were followed during their pregnancy and in the first year with their newborn. The BrainAGE-project studied the mothers and children when the children were around the age of four. All of the mothers have provided written informed consent. The data that was used for the current study was obtained from the BrainAGE-project.

Participants

All of the participants volunteered to participate in this study. In total 75 children and mothers have participated in this study, of the 75 children 41 were girls and 34 were boys. There was one pair of twins (boy and girl). The mothers had a mean age of 35.69 years (s.d.= 3.76) during the current study. The children had a mean age of 4.03 years (s.d. = .06). More details about the participants are shown in Table 1.

Measurements

Mindful parenting. Maternal mindful parenting was measured using the Dutch version of the The Interpersonal Mindfulness in Parenting Scale (IM-P-NL; Duncan, 2007).

The questionnaire was translated by De Bruin (2012). It consisted of five subscales: listening with full attention, emotional awareness of self and child, non-judgmental acceptance of self and child, self-regulation in the parenting relationship and compassion for the self and child. The reliability of the subscales was tested with the Cronbach's alpha and is based on the sample. The subscale listening with full attention consisted of five items (α = .456), emotional awareness of the self and child consisted of six items (α = .354), non-judgmental acceptance of self and child consisted of seven items (α = .575), self-regulation in the parenting relationship consisted of six items (α = .649) and compassion for the self and child consisted of seven items (α = .640). The total questionnaire included 31 questions about mindful parenting (α = .828). The original questionnaire was in English however, for this study the questionnaire was translated to Dutch (See Appendix B). A few examples of the questions that were asked are: *"I listen carefully to the ideas of my child even when I don't agree with him/her." "It's difficult for me to register how my child is feeling."* The mothers could choose from five answers: *"Never true",* "*Rarely true"*, "*Sometimes true"*, "*Often true*" and "*Always true"*. Higher scores on this part of the questionnaire indicated a higher level of mindful parenting.

Intelligence. General intelligence of the child was measured with the SON-R, which consisted of two subscales namely the mosaic tasks and the categories task. The first subscale of the SON-R test is the mosaic task which is divided into two parts. In part one the child had to replicate mosaic patterns with three, four or five red squares. The test leader does the first three items of this part, items four to six were done by the child. In the second part of the mosaic test, the child also had to replicate some mosaic patterns, this time the child gets red, yellow and red-yellow squares. The items seven to fifteen were done by the child. In the second part there is a time limit of 2.5 minutes. When the child makes mistakes in two up following items, the second part of the mosaic task will be ended. The highest score a child could reach was fifteen, the minimal score was three. Higher scores on this subscale indicate a higher level of non-verbal intelligence.

The second subscale of the SON-R is the category task, this subscale also consists of two parts. In the first part the child sees two pictures and gets four or six cards that he or she has to sort by category. In the first item the child has to put four cards in the right place. In the items two to seven the child has to put six cards in the right place. The first two cards were done by the test leader, the other cards were done by the child. In the second part the child saw two pages of a book, in the right page there were three pictures with common

characteristics, the child had to choose two pictures of the five from the left page that belonged to the same category as the pictures in the right page. The maximum score of the category tasks is fifteen. Higher scores on this subscale also indicate a higher level of non-verbal intelligence.

Procedure

The questionnaires were send to the mothers via internet and the SON-R task was conducted in the Babylab of Tilburg University. There was only one test leader who did the SON-R task.

Analysis

Confounders that were taken into account in this study are the level of education of the mother, the number of children the parents have and the sex of the four-year-old. There are many studies about the sex differences in intelligence. In a study was found that females have an advantage in verbal tasks while males have an advantage in manipulating visual images in working memory (Halpern & LaMay, 2000). In another study was found that Chinese boys had an higher mean full scale IQ, higher performance IQ and a higher verbal IQ than Chinese girls. Boys also scored significantly higher on picture arrangement, picture complement, block design and object-assembly subtests (Liu & Lynn, 2015). It could be that the boys already have a bigger advantage on the SON-R tasks. It could also be that a mother who has a higher education level scores higher on mindful parenting and has a more intelligent child and therefore, the child will score higher on the SON-R tasks. Lemos et al. (2011) found that the level of education of the parents predicts the intelligence of their adolescent children.

To look at the association between mindful parenting and intelligence in four-year-old children, the data is analyzed with the help of six multiple linear regression analyses, which each consisted of two models. The first model consisted of the dependent and independent variables, in the second model the confounding variables were added. In the first regression the dependent variable was the total score on both the SON-R tasks. The independent variables were the sub scores of mindful parenting. In the second regression the dependent variable was the total score on both the SON-R tasks, the independent variable was the total score on mindful parenting. In the third regression the dependent variable was the score on the SON-R mosaic task, the independent variables were the sub scores of mindful parenting. In the fourth regression the dependent variable was the score on the SON-R mosaic task, the independent variable was the total score on mindful parenting. In the fifth regression the

dependent variable was the score on the SON-R category task, the independent variables were the sub scores of mindful parenting. In the sixth regression the dependent variable was the score on the SON-R category task, the independent variable was the total score on mindful parenting.

Results

At the beginning of the analysis, the descriptive measures and the correlations between the subscales of mindful parenting were measured. The descriptive measures are shown in Table 2, the correlations are shown in Table 3. The table shows that all subscales significantly positively correlate with each other with the exception of the correlation between the subscales 'emotional awareness of self and child' and 'listening with full attention', (r = .114; p =.33). A borderline significant positive correlation was found between the total score on mindful parenting and the total score on the SON-R, (r =0.198; p =.09). The correlations between the total mindful parenting score and the separate SON-R tasks were also measured. No significant correlation was found between mindful parenting and the SON-R category task, (r = .100; p =.39). Between the total mindful parenting score and the SON-R mosaic task, a positive significant correlation was found, (r =.255; p = .03). Between the sub scores on, mindful parenting and the SON-R category task, no significant correlations were found. Between the mindful parenting sub scores and the SON-R mosaic task, a positive correlation was found between the subscale 'Self-regulation in the parenting relationship' and the SON-R mosaic task, (r =.234; p = .04).

Total score on the SON-R tasks

The sub scores of mindful parenting explained 8.7% of the variance in the total score on the SON-R, $F(5,68) = 1.30$, p =.27. The effects of the sub scores of mindful parenting on both the SON-R tasks were not significant. Although, the effects were not significant, it was remarkable that self-regulation in the parenting relationship, b = .251, t(68) = 1.56, p = .12, emotional awareness of self and child, b =.18, t(68) = 1.00, p =.32 and compassion for the self and child, b = .13, t(68) =.82, p = .41 seem to have had a positive effect on the total score on the SON-R while, non-judgmental acceptance of self and child, b = -.09, t(68) = -.47, p =.64 and listening with full attention, b = -.19, t(68) = -1.00, p = .32 seem to have had a negative effect on the total score on the SON-R. After adding the covariates $\Delta R^2 = .016$, $\Delta F(6,62) = .18$, p = .78, the effect of the sub scores of mindful parenting on both the SON-R tasks were still not significant.

No significant effect was found of the total score on the mindful parenting questionnaire on both the SON-R tasks. The total score on mindful parenting explained 4.6% of the variance in the total score on the SON-R tasks, $F(1,72)= 3.44$, $p =.0.07$. After adding the covariates, $\Delta R^2 = .02$, $\Delta F(6,66) = .22$, $p = .72$, still no significant effects were found.

SON-R mosaic task

The sub scores of mindful parenting explained 10.4% of the variance in the score on the SON-R mosaic task, $F(5,68) = 1.57$, $p =.18$. The effects of the sub scores of mindful parenting on the SON-R mosaic task were not significant. Although, the effects were not significant, it was remarkable that self-regulation in the parenting relationship, b = .11, t(68) = 1.33, $p = .19$, emotional awareness of self and child, b =.11, t(68) = 1.19, $p =.24$ and compassion for the self and child, b = .09, t(68) =1.19, $p = .24$ seem to have had a positive effect on the score on the SON-R mosaic task while, non-judgmental acceptance of self and child, b = -.04, t(68) = -.46, $p =.65$ and listening with full attention, b = -.09, t(68) = -.90, $p = .37$ seem to have had a negative effect on the SON-R mosaic task. After adding the covariates, $\Delta R^2 = .05$, $\Delta F(6,62) = .67$, $p = .41$, still no significant effects were found.

The total score on mindful parenting explained 6.5% of the variance in the SON-R mosaic task, $F(1,72)= 4.98$, $p =.03$. The total score on mindful parenting had a significant positive effect on the SON-R mosaic task, b = .04, t(72) = 2.23, $p =.03$. After adding the covariates, $\Delta R^2 = .04$, $\Delta F(6,66) = .45$, $p = .40$, the effect of the total score on mindful parenting still had a positive significant effect on the SON-r mosaic task score.

SON-R category task

The sub scores of mindful parenting explained 4.2% of the variance in the score on the SON-R category task, $F(5,68) = .60$, $p =.70$. Although, the effects of the sub scores of mindful parenting on the SON-R category task were not significant, it was remarkable that self-regulation in the parenting relationship, b = .14, t(68) = 1.29, $p = .20$, emotional awareness of self and child, b =.07, t(68) = .58, $p =.56$ and compassion for the self and child, b = .03, t(68) =.31, $p = .75$ seem to have had a positive effect on the score on the SON-R category task while, non-judgmental acceptance of self and child, b = -.04, t(68) = -.35, $p =.73$ and listening with full attention, b = -.11, t(68) = -.80, $p = .43$ had a negative effect on the SON-R category task. After adding the covariates, $\Delta R^2 = .02$, $\Delta F(6,66) = .24$, $p = .96$, still no significant effects were found.

The total score on mindful parenting explained 1.5% of the variance in the score on the SON-R mosaic task, $F(1,72)= 1.12$, $p = .29$. The effect of the total score on mindful parenting on the SON-R mosaic task not significant. After adding the covariates, $\Delta R^2 = .03$, $\Delta F(6,66) = .31$, $p = .89$, still no significant effects were found. The outcomes of the six regression analyses are also shown in Table 4 and Table 5.

Discussion

The aim of this study was to investigate the association between maternal mindful parenting and general intelligence in four-year-old children. A significant effect was found that was in accordance with the hypothesis that more maternal mindful parenting is associated with higher general intelligence in a four-year-old child. Namely, children of whom the mothers scored higher on mindful parenting, performed better on the intelligence SON-R mosaic task. However, the children of mothers who scored higher on mindful parenting did not score higher on the intelligence SON-R category task, they also did not have a higher total score of both the SON-R tasks.

The finding that higher maternal mindful parenting is associated with a higher score on the SON-R mosaic task but not on the category task could be the result of the fact that it are different types of tests. The category task is a reasoning test while, the mosaic task is a more spatial, performance test (Tellegen, Winkel, Wijnberg-Williams, & Laros, 1998). Thus, it could be that mindful parenting does have an effect on spatial or performance tests but not on reasoning tests. This is in line with the study of Geng, Zhang & Zhang (2011), who found that participants who were in a mindful learning condition, responded faster to mental rotation tasks than the participants who were in the mindless learning condition (Geng et al., 2011). This study suggests that mindfulness can improve an individual's spatial cognition which is in line with the findings of the current study. In another study was found that mindfulness training could lead to improved visuo-spatial processing, working memory and executive functioning (Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). It could be the case that maternal mindful parenting leads to the child being more mindful and therefore, the child may be better at spatial tests. But, to confirm this, more research is necessary.

Because this is the first study about the association between maternal mindful parenting and general intelligence in four-year-old children, the findings cannot be compared to previous studies. But the findings are similar to the findings of Bennet et al. (2011), who found that a certain aspect of mindful parenting could lead to higher emotional intelligence in

children. Because this study did not only look at parental warmth but at all the subscales of mindful parenting, it contributes to having more knowledge about all the aspects of mindful parenting and its different effects on general intelligence in children.

Strengths and limitations

A strength of this study is the standardization. Only one test leader was used to do the SON-R tasks with the children. Furthermore, the SON-R tasks were always performed in the same room, where there were hardly any or no distractions from outside. All tasks were also video recorded. This is also the first study that looks at the relation between mindful parenting and general intelligence in children.

A limitation of this study is the fact that not all the tasks of the SON-R were used to test general intelligence. Only the mosaic and category tasks were tested and because of this, we were not able to give the children an intelligence quotient (IQ) score. The SON-R 2 ½-7 is a non-verbal intelligence test. Thus, we cannot say anything about the relation between maternal mindful parenting and verbal intelligence in a child. Also, mindful parenting was tested with a questionnaire, it could be that mothers felt like they were a bad mother if they gave a certain answer on a question. It could be that sociability plays a role in answering this questionnaire. Also, all subscales had a low reliability, especially the reliability on the subscale emotional awareness of the self and child was very low. Because of this it could be that the subscales of mindful parenting are not correctly measured. The reliability of the subscale listening with full attention could be greatly increased by removing item 1 from this subscale. The questionnaire was originally developed to measure mindful parenting in adolescents, but in this study the questionnaire was used for mothers with four- year-old children. Therefore, it could be that some questions were harder to answer.

In this study 75 mothers and children participated, in further research a bigger sample would be recommended. We also wanted to look at the nationality of the mother and if this had any impact on the relation between mindful parenting and intelligence, but only three mothers were of another nationality than Dutch. Therefore, no conclusions could be made about the nationality. Although, the children were all tested in the same room in the baby lab, the children came at different hours. Some children already had gone to school and were tested in the evening. It could be that those children had less concentration and therefore, scored lower on the SON-R tasks.

Future research

In replication studies or follow-up studies it could be wise to use all the SON-R 2½-7 tasks. In that way, a total IQ score can be given to the child. The IQ-score is something that is widely known and can easily be compared to other IQ scores. A bigger sample size may also lead to significant findings. To test if the nationality of the mother has any effect on the association between maternal mindful parenting and intelligence in the child, there should be more diversity in the sample. A comparison of groups may give some interesting insights. Because this study has solely focused on the influence of maternal mindful parenting, it could be insightful to study the influence of paternal mindful parenting on the child. The father may have a different influence than the mother. Because this is the first study to examine this association, more studies are necessary to make some strong conclusions.

Implications

If following studies also find that maternal mindful parenting is associated with higher general intelligence in four-year-old children then it could be helpful to give parents mindfulness interventions. Especially the parents of less gifted children. When the parents use more mindfulness in their parenting this may have positive effects on the child. If it seems that mindful parenting really does increase the general intelligence of a child, the interventions may lead to the children being able to go to a normal school instead of a special need school. Interventions for the teachers may also be helpful. Dutch children are in school five days a week and see their teachers almost as much as their parents. Therefore, the teachers could also have a big influence on the children.

Conclusion

In sum, the results of the current study indicate that maternal mindful parenting could be associated with an aspect of general intelligence in four-year-olds. Therefore, the hypothesis is partly validated. The current study contributes to the research about mindful parenting and cognitive abilities in children. However, because this is the first study about this association more research is necessary to be able to conclude anything.

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Appendix A

Table 1

General information of the mothers

Nationality		Education level	
Dutch	73	A-level education	4
German	1	General vocational training	19
French	1	Higher vocational training	31
Thai	1	University degree	17
		Postgraduate degree or higher	4

Note. None of the mothers reported to have no education or a GCSE-level education

Table 2

Descriptive measures

Score	Means	SD	Minimum	Maximum
Total score MP	115.32	9.82	95	133
Total score SON-R	15.91	3.06	8	23
SON-R category	8.24	2.07	3	13
SON-R mosaic	7.67	1.56	4	11

Note. SD= Standard deviation

Table 3

Correlations between mindful parenting and the SON-R

	SelfRegPar	EmotAw	NonJudgAc	CompasSelf	ListFullAt	SONcat	SONmos	TotalscoreMP
SelfRegPar	1	.327**	.592**	.437**	.418**	.143	.235*	.778**
EmotAw	.327**	1	.461**	.282*	.114	.116	.222	.578**
NonJudgAc	.592**	.461**	1	.668**	.313**	.067	.195	.867**
CompasSelf	.437**	.282*	.668**	1	.348**	.048	.222	.792**
ListFullAt	.418**	.114	.313**	.348**	1	-.020	.025	.569**
SONcat	.143	.116	.067	.048	-.020	1	.409**	.100
SONmos	.235*	.222	.195	.222	.025	.409**	1	.255*
TotalscoreMP	.778**	.578**	.867**	.792**	.569**	.100	.255*	1

Note. ** is significant at the 0.01 level (two-tailed). * is significant at the 0.05 level (two-tailed).

SelfRegPar Self-regulation in the parenting relationship, EmotAw Emotional awareness of self and child, NonJudgAc Non-judgemental acceptance of the self and child, CompasSelf Compassion for the self and child, ListFullAt Listening with full attention

Table 4

Multiple regressions of total score on maternal mindful parenting and intelligence in four-year-olds

Model 1		SON-R mosaic			SON-R category			SON-R total		
		B	SE	ß	B	SE	ß	B	SE	ß
	Total score MP	.041*	.018	.254	.026	.024	.124	.067	.036	.213
Model 2										
	Total score MP	.040*	.019	.249	.023	.026	.108	.062	.039	.200
	General vocational	-1.158	.877	-.324	.907	1.181	.195	-.250	1.745	-.036
	Higher vocational	-.943	.838	-.298	1.220	1.128	.296	.278	.1668	.045
	University degree	-.731	.883	-.197	1.088	1.189	.225	.357	1.757	.049
	Postgraduate degree	-.991	1.215	-.125	.846	1.635	.082	-.144	2.416	-.009
	Gender child	-.249	.377	-.080	-.409	.508	-.100	-.659	.751	-.108
	Number of children	.189	.294	.079	.052	.396	.017	.240	.586	.052

Note. * is significant at the 0.05 level (two-tailed)

Table 5

Multiple regressions of sub scores of maternal mindful parenting and intelligence in four-year-olds

		SON-R mosaic			SON-R category			SON-R total		
Model 1		B	SE	ß	B	SE	ß	B	SE	ß
	SelfRegPar	.109	.082	.199	.142	.110	.200	.251	.161	.236
	EmotAw	.110	.092	.156	.073	.125	.079	.183	.182	.133
	NonJudgAc	-.043	.093	-.083	-.044	.126	-.065	-.087	.184	-.086
	CompasSelf	.094	.079	.187	.033	.106	.051	.127	.155	.139
	ListFullAt	-.087	.097	-.116	-.105	.131	-.107	-.191	.191	-.131
Model 2										
	SelfRegPar	.100	.089	.183	.151	.122	.212	.250	.178	.235
	EmotAw	.143	.097	.202	.063	.133	.068	.207	.194	.149
	NonJudgAc	-.036	.096	-.070	-.028	.132	-.042	-.065	.193	-.064
	CompasSelf	.108	.083	.214	.000	.114	-.001	.107	.167	.109
	ListFullAt	-.134	.106	-.178	-.075	.146	-.077	-.209	.213	-.143
	General vocational	-1.472	.922	-.412	1.061	1.268	.228	-.411	1.855	-.059
	Higher vocational	-1.490	.894	-.471	1.132	1.229	.274	-.358	1.798	-.058
	University degree	-1.115	.921	-.300	1.125	1.266	.232	.010	1.851	.001
	Postgraduate	-1.611	1.272	-.203	.777	1.749	.075	-.835	2.558	-.054
	Number of children	.239	.302	.100	.133	.415	.043	.372	.607	.080
	Gender child	-.162	.387	-.052	-.325	.531	-.080	.487	.777	-.080

Note. SelfRegPar Self-regulation in the parenting relationship, EmotAw Emotional awareness of self and child, NonJudgAc Non-judgemental acceptance of the self and child, CompasSelf Compassion for the self and child, ListFullAt Listening with full attention

Appendix B

De onderstaande stellingen beschrijven verschillende soorten interacties tussen ouders en kinderen, zoals deze zich in de dagelijkse praktijk voordoen. Laat alstublieft weten of u denkt dat de stelling: "nooit waar", "zelden waar", "soms waar", "vaak waar" of "altijd waar" is voor u. Onthoudt, er zijn geen goede of foute antwoorden en antwoordt alstublieft datgene wat werkelijk weergeeft wat uw ervaring is en niet wat u denkt dat uw ervaring zou moeten zijn. Behandelt u alstublieft iedere stelling apart van alle andere stellingen.

	Nooit waar	**Zelden waar**	**Soms waar**	**Vaak waar**	**Altijd waar**
1.Ik merk dat ik met één oor naar mijn kind luister, omdat ik tegelijkertijd bezig ben iets anders te doen of aan iets anders te denken.	1	2	3	4	5
2.Wanneer ik me overstuur/geagiteerd voel naar mijn kind, merk ik op hoe ik me voel vóórdat ik overga tot actie.	1	2	3	4	5
3.Ik merk hoe veranderingen in de stemming van mijn kind mijn eigen stemming beïnvloeden.	1	2	3	4	5
4.Ik luister zorgvuldig/aandachtig naar de ideeën van mijn kind, zelfs als ik het er niet mee eens ben.	1	2	3	4	5
5.Ik reageer vaak te snel op iets wat mijn kind zegt of doet.	1	2	3	4	5
6.Ik ben me er van bewust hoe mijn eigen stemmingen invloed hebben op de manier waarop ik mijn kind behandel.	1	2	3	4	5
7.Zelfs wanneer ik me er ongemakkelijk bij voel, sta ik toe dat mijn kind zijn/haar gevoelens uit.	1	2	3	4	5
8.Wanneer ik me overstuur/geagiteerd voel naar mijn kind, vertel ik hem/haar rustig hoe ik me voel.	1	2	3	4	5
9.Ik haast me tijdens activiteiten met mijn kind zonder echt aandachtig te zijn voor hem/haar.	1	2	3	4	5
10.Ik heb moeite om de groter wordende onafhankelijkheid van mijn kind te accepteren.	1	2	3	4	5
11. Hoe ik mij voel neigt mijn beslissingen in het opvoeden te beïnvloeden, maar dat realiseer ik me pas later.	1	2	3	4	5

12. Het is moeilijk voor mij om aan te geven wat mijn kind voelt.	1	2	3	4	5
13. Wanneer ik dingen met mijn kind aan het doen ben dwalen mijn gedachten af en ben ik gemakkelijk afgeleid.	1	2	3	4	5
14. Wanneer mijn kind zich misdraagt word ik zo boos dat ik dingen zeg of doe waar ik later spijt van heb.	1	2	3	4	5
	Nooit waar	**Zelden waar**	**Soms waar**	**Vaak waar**	**Altijd waar**
15. Ik neig hard voor mezelf te zijn wanneer ik fouten maak als ouder.	1	2	3	4	5
16. Wanneer mijn kind iets doet waarover ik boos word, probeer ik mijn emoties onder controle te houden.	1	2	3	4	5
17. Wanneer tijden heel lastig zijn met mijn kind, neig ik mezelf daarvan de schuld te geven.	1	2	3	4	5
18. Wanneer dingen die ik als ouder probeer te doen niet lukken, kan ik dit accepteren en door gaan.	1	2	3	4	5
19. Ik ben vaak zo druk bezig met denken aan andere dingen dat ik me realiseer dat ik niet echt luister naar mijn kind.	1	2	3	4	5
20. Wanneer ik als ouder iets doe waar ik spijt van heb, probeer ik niet te hard voor mezelf te zijn.	1	2	3	4	5
21. In moeilijke situaties met mijn kind, wacht ik even zonder direct te reageren.	1	2	3	4	5
22. Het is gemakkelijk voor mij om aan te geven wanneer mijn kind ergens bezorgd over is.	1	2	3	4	5
23. Ik neig kritisch te zijn tegenover mezelf over het niet zijn van de soort ouder die ik wil zijn.	1	2	3	4	5
24. Ik heb alle aandacht voor mijn kind wanneer we samen tijd doorbrengen.	1	2	3	4	5
25. Ik ben aardig voor mijn kind wanneer hij/zij verdrietig is.	1	2	3	4	5
26. Wanneer ik het moeilijk heb in het opvoeden, voelt het alsof andere ouders het gemakkelijker hebben.	1	2	3	4	5
27. Wanneer mijn kind door een moeilijke tijd gaat probeer ik hem/haar de liefde en zorg te geven die hij/zij nodig heeft.	1	2	3	4	5

28. Ik probeer het standpunt van mijn kind te begrijpen, zelfs wanneer zijn/haar meningen voor mij nergens op slaan.	1	2	3	4	5
29. Wanneer mijn kind iets doet wat mij boos maakt, sla ik door in mijn gevoelens	1	2	3	4	5
30. Ik weet wat mijn kind voelt, zelfs als hij/zij niks zegt.	1	2	3	4	5
31. Ik probeer om begripvol en geduldig te zijn naar mijn kind wanneer hij/zij het moeilijk heeft.	1	2	3	4	5