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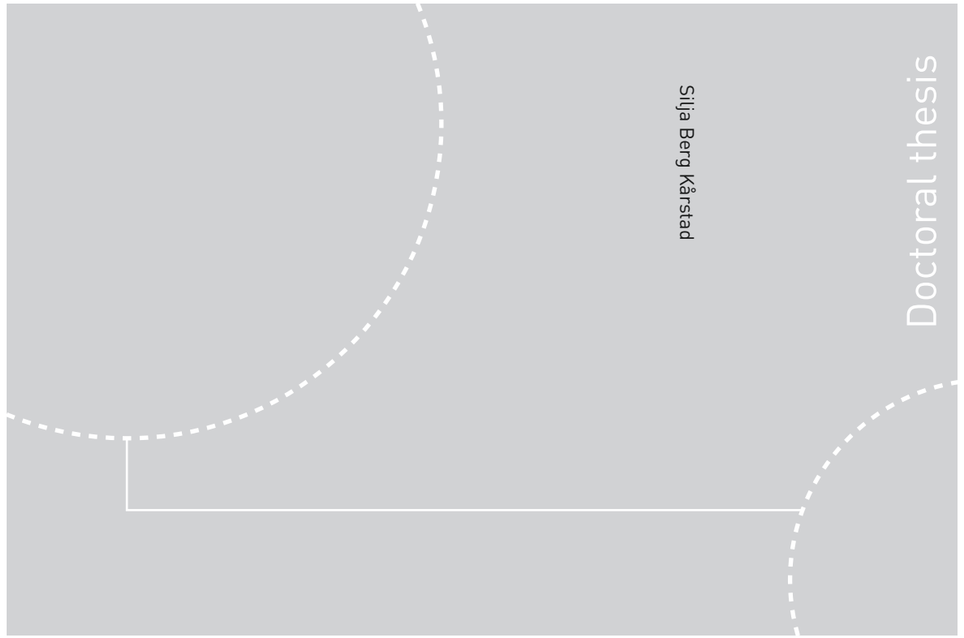


Doctoral theses at NTNU, 2016:229

Silja Berg Kårstad

# Young children's emotion understanding: The impact of parent and child factors, socioeconomic status, and culture

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**NTNU**
Norges teknisk-naturvitenskapelige universitet
Thesis for the Degree of
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Trondheim, september 2016

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# NORSK SAMMENDRAG

## Små barns forståelse av følelser: Betydningen av foreldre og barn faktorer, sosioøkonomisk status, og kultur

Barns evne til å forstå sine egne og andres følelser henger sammen med god psykisk helse, evnen til å etablere og opprettholde vennskap og skoleprestasjoner. Målet for denne avhandlingen var å undersøke hva som påvirker barns forståelse av følelser i førskolealder. To av arbeidene inneholdt data fra den longitudinelle populasjonsstudien Tidlig Trygg i Trondheim (TTiT), der mellom 756 og 926 barn og deres foreldre deltok. I Studie I undersøkte vi foreldre til fire-åringer sin evne til å estimere sitt barns forståelse av følelser, samt sammenhengen mellom hvor gode foreldre var til å estimere og hvor god barnets faktiske forståelse av følelser var. Så undersøkte vi sammenhenger mellom foreldreestimering og barnets mentale helse, barnets verbale ferdigheter, kvaliteten på foreldre-barn samspillet og foreldres utdanningsnivå. I Studie II undersøkte vi hva som påvirker utvikling av barns emosjonelle forståelse fra 4 til 6 år. Vi så på betydningen av hvor godt foreldre treffer med sin estimering av barnets emosjonelle forståelse, betydning av foreldre-barn samspillet og barnets sosiale kompetanse. Studie III var en undersøkelse av emosjonell forståelse hos 100 brasilianske barn i alderen 3 til 5 år fra to ulike sosioøkonomiske klasser, der vi sammenlignet våre funn med studier av barns forståelse av følelser fra et annet ikke-vestlig land (Peru) og to Europeiske land (Norge og Italia).

Resultatene fra Studie I viste at 91% av foreldrene overvurderte sitt barns forståelse av følelser. I gjennomsnitt vurderte foreldre deres 4-åring til å ha et nivå av emosjonell forståelse som er vanlig for en 7-åring. Til tross for denne overvurderingen, jo bedre foreldre estimerte barnets emosjonelle forståelse, desto bedre var barna til å forstå følelser. I tillegg var foreldre som estimerte godt mer sensitive i samspill med sine barn enn foreldre som i ennå større grad misforstod hvor mye av følelser barnet forstod. Barn av foreldre som estimerte bedre enn andre foreldre hadde også bedre verbale evner. Studie II viste at utvikling av emosjonell

forståelse fra 4 til 6 år ble predikert av foreldres evne til å estimere sitt barns forståelse av følelser. Videre kom det frem i studie II at sosialt kompetente barn hadde en større forbedring i emosjonell forståelse enn mindre sosialt kompetente barn. Studie III viste at brasilianske barn fra lavere sosial klasse hadde et lavere nivå av emosjonell forståelse enn barn fra høyere sosial klasse, og det var særlig det å gjenkjenne positive og nøytrale følelser som var vanskelig for barna fra lavere sosial klasse. Barn fra høyere sosial klasse i Brasil hadde nesten samme nivå av emosjonell forståelse som barn fra Norge og Italia, og barn fra lavere sosial klasse i Brasil hadde et lignende nivå av emosjonell forståelse som barn fra Peru.

## ENGLISH ABSTRACT

### Young children's emotion understanding: The impact of parent and child factors, socioeconomic status, and culture

Children's ability to understand their own and others' emotions is related to good mental health, the ability to establish and maintain friendships and school performance. The aim of this thesis was to examine what influences children's emotion understanding in the preschool years. Two of the studies contained data from the longitudinal population study the Trondheim Early Secure Study (TESS), where between 756 and 926 children and their parents attended. In Study I, we examined the parents of 4-year-olds and their ability to accurately estimate their child's emotion understanding, as well as the associations between parents' accuracy of estimation and the child's emotion understanding, the child's mental health, the child's verbal skills, the quality of parent-child interaction and parental education. In Study II, we examined what influences the development of children's emotion understanding from ages 4 to 6; the importance of parental accuracy of estimation of the child's emotion understanding, the parent-child interaction and the child's social skills. Study III was a study of emotion understanding among 100 Brazilian children aged 3 to 5 from two different socioeconomic groups. In addition, we compared our findings with studies of children's emotion understanding from a non-Western country (Peru) and two European countries (Norway and Italy).

The results of Study I showed that 91% of the parents overestimated their child's emotion understanding, and that they considered their 4-year-old to have a level of emotion understanding that is characteristic of a 7-year-old. The study also showed that the more accurate parents were in estimating their child's level of emotion understanding, the better the children understood emotions and the better their verbal skills, and that these parents were more sensitive in interacting with their children. Study II showed that positive development in

emotion understanding from 4 to 6 years was related to the parents' ability to accurately estimate their child's emotion understanding. Socially competent children also had a more positive increase in emotion understanding than less socially competent children. Study III showed that Brazilian children from a lower social class had a lower level of emotion understanding than children from a higher social class. In particular, recognizing positive and neutral emotions was more difficult for children from lower social class. Also, children from a higher social class in Brazil had almost the same level of emotion understanding as children from Norway and Italy, and children from a lower social class in Brazil had a similar level of emotion understanding as children from Peru.

# CONTENTS

APPENDIX

Table A. Summary of main instruments used in the current thesis

Consent TESS T1

Information/consent TESS T2

Information/consent Study III

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The studies presented in this thesis were conducted at the Norwegian University and Technology (NTNU), Faculty of Social Sciences, Department of Psychology and at the Federal University of Paraíba, Department of Psychology, Brazil. The studies were supported by "The National Program for Integrated Clinical Specialist and PhD-training for Psychologists" in Norway. This is a joint program between the Universities of Bergen, Oslo and Tromsø, The Norwegian University of Science and Technology (Trondheim), the Regional Health Authorities, and the Norwegian Psychological Association. The program is funded jointly by the Ministry of Education and Research and the Ministry of Health and Care Services. In addition, two of the studies were part of a larger research project, the Trondheim Early Secure Study (TESS), funded by the Norwegian Research Council and the Liaison Committee between the Central Norway Regional Health Authority and NTNU.

I would like to thank all the Norwegian and Brazilian children, parents and day-care teachers participating in my studies. Special thanks go to our eminent research assistants at the TESS for their contribution to testing and interviewing parents and children.

It has been a long process, and my supervisors Turid Suzanne Berg-Nielsen and Lars Wichstrøm have always been supportive and patient and shared their knowledge with me, and I am very grateful. I also want to thank my "mentor" since I was a student, Arne Vikan: thanks to you I became interested in children's emotions, and thank you for co-authoring the Brazilian study. I would also like to thank my co-authors Júlio Rique, Pollyana de Lucena and Eloá Losano de Abreu from Brazil, who made it possible during my several visits to Brazil to plan and conduct the study of Brazilian children's emotion understanding. Special thanks also goe to the co-authors of the other articles, Øyvind Kvello, Jay Belsky and Trude Reinfjell. Special thanks go to Francisco Pons, who introduced me to the main instrument of this thesis (the Test of Emotion Comprehension) and who was always helpful with comments. I also

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Trondheim, March 2016

Silja Berg Kårstad

## LIST OF PAPERS

**Paper I (Study I)**

Kårstad, S. B., Kvello, Ø., Wichstrøm, L., & Berg-Nielsen, T. S. (2014). What do parents know about their children's comprehension of emotions? Accuracy of parental estimates in a community sample of preschoolers. *Child: Care, Health and Development, 40*(3), 346-353. doi: 10.1111/cch.12071

**Paper II (Study II)**

Kårstad, S. B., Wichstrøm, L., Reinfjell, T., Belsky, J., & Berg-Nielsen, T. S. (2015). What enhances the development of emotion understanding in young children? A longitudinal study of interpersonal predictors. *British Journal of Developmental Psychology Child, 33(3),* 340-354. doi: 10.1111/bjdp.12095

**Paper III (Study III)**

Kårstad, S. B., Vikan, A., Berg-Nielsen, T. S., Lucena, P.D., Abreu, E. L. D., and Rique, J. (2016). Young Brazilian children's emotion understanding: A comparison within and across cultures. *Journal of Educational and Developmental Psychology*. In press.

# ABBREVIATIONS

| | |
|---|---|
| CS | Complex Sample |
| EA | Emotional Availability |
| EC | Emotion Comprehension |
| EU | Emotion Understanding |
| GLM | General Linear Model |
| ICC | Intra Class Correlation |
| ILO | International Classifications of Occupations |
| NTNU | Norwegian University of Science and Technology |
| PAPA | Preschool Age Psychiatric Assessment |
| PPVT-III | Peabody Picture Vocabulary Test |
| SD | Standard Deviation |
| SDQ | Strengths and Difficulties Questionnaire |
| SE | Standard Error |
| SES | Socioeconomic Status |
| SSRS | Social Skills Rating System |
| TEC | Test of Emotion Comprehension |
| ToM | Theory of Mind |
| TRF | Teacher Report Form |
| TESS | Trondheim Early Secure Study |
| TTiT | Tidlig Trygg i Trondheim |

## CLARIFICATIONS

The present thesis includes three studies about young children's emotion understanding; however, different terms were used for the same measures in the various papers. In Study I, we used the concept of *Emotion comprehension* (EC). This was because we wanted the concepts we were investigating to use the same term as the concept in the main instrument, the Test of Emotion Comprehension (TEC). However, in Study II and III we chose to use the concept of *Emotion understanding* (EU), because this term is used much more in the literature. Furthermore, in Study I we used *Accuracy of parental estimation*, which was changed to *Accuracy of parental mentalization* in Study II to show that this measure has also been derived from the mentalization literature. Additionally, the concept of *Parent-child interaction* used in Study I was changed to *Parental emotional availability* in Study II, in order to use a concept that described more of what was being measured by the instrument we used (Emotional Availability Scale). Finally, *Language comprehension* (Study I) was changed to *Verbal skills* in Study II, because this term is also more widely used in the literature. In the rest of this thesis, the denotations used will mainly be those in Study II (except when describing the research questions and the results from Study I, where some of the concepts used in Study I will be used).

# INTRODUCTION

## 1.1 BACKGROUND FOR THE THESIS

As a psychology student, I developed an interest in children's emotion understanding (EU) during my work as a research assistant during the semester of developmental psychology, when testing and interviewing many preschool children about their understanding of emotion regulation. I followed this interest, and my master's thesis was about children's understanding of mixed emotions, one of the most complex levels of EU. Later, I started to work as a clinical psychologist at a child welfare mother-child unit, and for the last six years I have worked at a child and adolescent psychiatry clinic (BUP) in addition to working on my PhD. These work experiences taught me that there are considerable individual differences in parents' ability to interact with their child in a sensitive and responsive manner, to understand mental states in themselves and in their child and to support their child's EU and emotion regulation. I was puzzled by my experience that there were also large individual differences in children's level of EU, both in normally developing children and children with somatic or mental health problems. I could meet a 5-year-old who had a better description of mixed emotions than an adult, and a teenager not able to distinguish between the emotions "sad" and "afraid". Additionally, I met parents from different cultures, and realized that this also has an impact on the parents' emotion socialization, e.g., while I could encourage naming and regulating negative emotions, some parents did not value or even talk about anger because of their cultural upbringing.

I found that my experience was confirmed in the EU literature, which showed that there are substantial individual differences in EU among children (Harris, 2000; Pons & Harris, 2005) and in parents' socialization of children's emotions (Eisenberg, Cumberland, & Spinrad, 1998). Summarizing the literature on individual differences, researchers have found

that these differences appear very early, are present at various ages, seem stable, are not restricted to specific components of EU, correlate with other aspects of the child's personality and may persist even after attending an intervention program (Harris, 2000; Pons & Harris, 2005). In addition, past research has documented links between EU and a variety of positive developmental outcomes, including secure attachment (de Rosnay & Harris, 2002; Fonagy & Target, 1997; Raikes & Thompson, 2008), social competence (Denham, 2006; J. Dunn & Cutting, 1999) and language skills (Pons, Lawson, Harris, & de Rosnay, 2003). Preschool children who are better at identifying emotions in others also have fewer behavioral problems (Hughes, Dunn, & White, 1998) and better social competence (Denham, 2006; J. Dunn & Cutting, 1999). Furthermore, delayed development of and limitations in EU are associated with mental health problems (for review, see Southam-Gerow & Kendall, 2002).

I have written this thesis on a topic that is both theoretically and clinically of interest. There is insufficient knowledge about the normative development of EU in countries like Norway and Brazil. In addition, more research on factors that predict EU development may help parents, teachers and clinicians to strengthen children's EU during the preschool years.

## 1.2 EMOTION UNDERSTANDING DEVELOPMENT

### 1.2.1 Emotion and emotional development

The concept *emotion* in this thesis denotes *feelings, moods* and *affects*. Emotion comes from the Latin word "emovere", which means "to move out". Emotions may be understood as a feeling state that involves a pattern of cognitive, physiological and behavioral reactions to events, and emotions are triggered by external and internal eliciting stimuli (Vikan, 2014). The classification of emotions has been discussed over the last forty years; mostly eight to ten of the same emotions repeatedly appear in different models. Emotions are often divided into "basic emotions" (e.g. happiness, fear, anger and sadness) and "social emotions" (e.g. pride, shame, guilt, envy and embarrassment) (J. Dunn, 1988; Harris, 1989; Sroufe, 1996). Social emotions are also called "self-conscious" because they require self-awareness that involves consciousness and a sense of "me" (Vikan, 2014). In the present thesis, we examine young children's understanding of the basic emotions sadness, fear, anger and happiness.

*Emotional development* concerns the increasing ability to experience, express, understand and regulate emotions from birth through late adolescence (Cohen, Onunaka, Clothier, & Poppe, 2005; Saarni, 2000). Children's emotional development does not occur in isolation; neural, cognitive and behavioral development interacts with emotional development, in addition to social and cultural influences. There are various emotional development theories that describe how growth and changes in these processes concerning emotions occur (Bridges, 1932; Campos, Campos, & Barrett, 1989; Izard, Huebner, Risser, Mcginnes, & Dougherty, 1980; Sroufe, 1996). Sroufe (1996) describes a developmental model with the emergence of specific emotions and the capacity for emotion regulation, where development always builds on what was previously present. In Sroufe's model, the child first experiences undifferentiated and global precursor emotions (pleasure, wariness and

frustration), and by the end of their first year the child develops more mature emotions, which is connected to the development of a self. During their first year of life, children experience e.g. joy, fear, anger and sadness. During their second year, children start to develop more self-conscious emotions, e.g. shame (around 18 months).

### 1.2.2 Background for the study of EU

The study of children's early understanding of emotions was not an important topic in developmental psychology before the late 1970s. The first papers on it were published in a book by the end of the eighties, edited by Saarni and Harris (1989). Researchers and theorists have used several concepts to describe the phenomenon examined in this thesis, including, for example, "emotion(al) consciousness", "emotional mentalization", "metaemotion", "emotional intelligence", "comprehension of emotions", "emotional literacy" and "theory of emotions". In this thesis, the concept of emotion understanding (EU) is used, which has been the most widely used concept throughout the past decade. EU has been defined as the way we understand, predict and explain our own and others' emotions (Harris, 1989; Saarni, 1999).

Harris (1989) states that it is important to differentiate between the development of children's *behavioral expression (experience)* and *conscious acknowledgement (or understanding*) of emotions. This is because the child's experience of emotions happens at an earlier age than the conscious awareness of what they are feeling. *Experiencing* and *understanding* e.g. mixed emotions (a negative and a positive emotion at the same time) is illustrative of this difference. Sroufe (1996) contends in his model that "by the end of the first year a number of discrete emotions, as well as blends, do exist…", but according to Harter and Buddin (1987) children are not able to *verbalize* an understanding of the experience of mixed emotions until they are between 8 and 11 years old. In the present thesis we examine children's *understanding* of emotions, and not their experience of different emotions.

Models of the development of emotion understanding (Halberstadt, Denham, & Dunsmore, 2001; Pons, Harris, & de Rosnay, 2004; Saarni, 1999) describe several aspects of EU or abilities that are part of it, from being able to label emotions to identifying emotion-eliciting situations and understanding more complex sentiments such as ambivalence and moral emotions. Some of the measures used to assess EU are adopted from theory of mind (ToM) methodologies. ToM is the ability to attribute mental states to oneself and others, and to understand that others have beliefs, desires and intentions different from one's own (Baron-Cohen, 2001). In contrast to ToM measures, EU taps into, for example, how the child believes a character in a story would *feel* instead of *think*. There are also researchers using a broader construct of theory of mind that is about the knowledge and awareness of mental states – including e.g. desires, beliefs and emotions (for reviews, see e.g. Flavell, 1999; Hughes & Leekam, 2004). In the present thesis, the concept of ToM is used in the more narrow way, as defined by Baron-Cohen (2001).

Researchers have studied the different aspects of EU, and Pons et al. (2004) reviewed the extensive literature and summarized nine *components* of EU. They suggested that the nine components can be organized in a developmental framework of external, mentalistic and reflective periods. The external period was conceived as comprising three aspects of EU: 1) recognition of emotions, 2) understanding that feeling is affected by external events or objects and 3) understanding the relation between memory and emotion (these three aspects correspond to the components "Recognition", "External" and "Reminder"). The mentalistic period is characterized by an ability to 4) connect beliefs to emotions, 5) understand that people's emotional reactions depend on their desires and 6) distinguish between the expression and experience of emotion (components "Belief", "Desire" and "Hiding"). The reflective period is comprised of 7) emotion regulation strategies, 8) an understanding of ambivalent emotions, and 9) comprehension of moral emotions (components "Regulation",

"Mixed" and "Morality"). In their research on British children, Pons and colleagues found that the majority of the youngest children (aged 3 years) understood the two first components and almost all of the oldest children (aged 11 years) understood eight or nine components. They found empirical support for the assumption that understanding the components in the external period is a prerequisite for understanding the components in the mentalistic period, and understanding internal aspects is a prerequisite for understanding the components in the reflective period.

During the last ten years many researchers have investigated this suggested framework by testing EU in different countries and settings (e.g. Albanese et al., 2006; Molina, Bulgarelli, Henning, & Aschersleben, 2014; Pons & Harris, 2005; Rocha et al., 2015; Tenenbaum, Visscher, Pons, & Harris, 2004), and there is still an ongoing discussion about whether this framework is universal. In the present thesis, this framework will be used to organize the description of EU; however, there are also other frameworks describing the same aspects of EU using other concepts (e.g. Saarni, 1990, 2000, 1999).

### 1.2.3 The nine components of EU according to Pons et al. (2004)

#### *1.2.3.1 Recognition*

Studies have shown that by the age 3 to 4, children start to recognize and name the basic emotions when presented with pictures (Denham, 1986; Hughes & Dunn, 1998; Pons et al., 2004). The experimental study of this component often consists of tasks in which the children should name emotions when presented with stories, pictures or puppets. For example, following a cartoon story, they point to pictures or drawings of facial expressions of a person being happy, sad, scared or angry. However, studying children in naturally occurring situations has shown that some children start to use emotion words, such as happy and scared, as early as 20 months. These are mostly emotions for the self, but some children also

comment on other persons' or toys' emotions (Bretherton, McNew, & Beeghly-Smith, 1981). Some argue that first the child understands their own internal state, then available aspects of others' experiences (their behavior) and finally the internal state of other people (that may not be perceptible to others) (Smiley & Huttenlocher, 1989). In addition, studies have shown that even though children are not able to verbalize their understanding, babies recognize different emotional expressions, especially if facial expressions are combined with variations in tone of voice. Saarni (1999) calls this ability a "proto-awareness". Also, social referencing studies have shown that by 12 months, babies recognize others' emotional expressions, and that babies' behavior (e.g. to approach a new toy or not) is guided by the parents' emotional expression (Harris, 1989).

#### *1.2.3.2 External*

Children aged 3 to 4 years start to understand how external causes influence felt emotions (e.g. being happy because you got a nice present or angry because someone destroyed your new toy) (Denham, 1986; Hughes & Dunn, 1998; Pons et al., 2004). Children experience and recognize different emotional situations, and Denham (1998) has shown in her research that identification of happy and sad situations is easier than angry and fearful emotional situations. Children's early difficulty in understanding e.g. fear has been explained through the more complex brow/eye/mouth movements in the facial expression of fear (Denham, 1998).

#### *1.2.3.3 Reminder*

Children aged 3 to 6 years start to understand the connection between emotions and memory, and can correctly recognize emotions (Harris, 1983; Lagattuta & Wellman, 2001; Lagattuta, Wellman, & Flavell, 1997; Pons et al., 2004). The component *Reminder* includes children's ability to understand that an emotion may decrease with time, and in addition that being in a situation can evoke memories of past situations and reactivate emotions felt before. For

example, in the TEC, the child is told a story about a protagonist who is looking at a picture of a rabbit (the protagonist's best friend) that has just recently been eaten by a fox, and the child is asked if the protagonist in the story feels happy, sad, alright or scared. The correct answer here is sad, because the picture reactivates the emotion felt when the protagonist's best friend was eaten by a fox.

#### *1.2.3.4 Desire*

Research has shown that children begin to understand how other people's desires are connected to their emotional reactions approximately between ages 3 and 5 years (Pons et al., 2004; Wellman & Banerjee, 1991; Yuill, 1984). This can be measured in experimental tasks in which the children acknowledge that a person would feel good when getting what he/she wants but feel sad or angry when desires are blocked, and that two people could experience a different emotion while in the same situation because of their different desires. Now the child can understand not only that emotions are connected to external aspects of different situations, but that the person's internal state also has an impact on the emotional experience.

#### *1.2.3.5 Belief*

The component *Belief* is one of the most studied components of EU. It is the ability to understand that a person's belief, either false or true, will affect the emotional reaction to a situation. Children between 4 and 6 years start to infer the correct emotion felt by the protagonist in a false belief story (Bartsch & Wellman, 1995; de Rosnay, Pons, Harris, & Morrell, 2004; Hadwin & Perner, 1991). Previous studies have shown that first the child develops the ability to understand theory of mind, or how a protagonist in a story *thinks*, and then after this ability is established, the child can acknowledge the correct *emotion* felt by a protagonist in a false belief task. For example, Bradmetz and Schneider (1999) told children aged 3 to 6 years a version of the story of Little Red Riding Hood. The majority of the

children answered that Little Red Riding Hood mistakenly thought it was grandmother lying in the bed (correct thought). However, the majority of children answered that Little Red Riding Hood would feel afraid seeing "grandmother" (incorrect emotion) and explained the emotion with e.g. "because it is a wolf". Several reasons have been debated for the lag between understanding the cognitive and the emotional aspect of the story, and the most plausible explanation is that as the child becomes older they are able to combine several types of information in a story.

#### *1.2.3.6 Hiding*

Sometimes emotions cannot be correctly identified on the basis of overt expressive behavior – more information is needed. Research has shown that children as young as 2 years old adapt their emotional expressions to the "expected emotion" (for example, smiling when getting a present they don't like). However, when interviewed afterwards, they do not have an understanding of their "hiding" behavior (Gross & Harris, 1988); rather, this understanding develops later. Children start to understand that outwardly expressed emotions do not always match the actual felt emotion around ages 4 to 6 (Gardner, Harris, Ohmoto, & Hamazaki, 1988; Jones, Abbey, & Cumberland, 1988; Joshi & MacLean, 1994). Previous research suggests that children's understanding of hiding positive emotions is more difficult than hiding negative emotions (Mizokawa, 2007). This is explained by parents' socialization of their children to hide negative emotions (e.g. disappointment) and show positive emotions (e.g. happiness) to protect another person's emotions or thoughts. In contrast, it is less usual to teach children to conceal their positive emotions (except in special settings, such as a funeral).

#### *1.2.3.7 Regulation*

This component is about children's understanding of how to regulate (or control) their emotions. Children aged 6 to 7 years mostly refer to behavioral strategies (e.g. go and play or smile instead) when regulating emotions (Harris, 1989; Pons et al., 2004). In addition, research has shown that children describe different emotion regulation strategies depending on the types of emotions (Dennis & Kelemen, 2009). For example, a study of 4- and 6-year-old Norwegian and Brazilian children's emotion regulation strategies showed that *play* was more frequently proposed as a strategy to reduce *anger* and *sadness* than *fear.* In addition, motoric activities (e.g. eating, drinking, swimming, bicycling) were proposed to reduce *anger* more frequently than *sadness* and *fear* (Vikan, Kårstad, & Dias, 2013). Children from 8 years old start to verbalize that psychological strategies (e.g. denial or distraction) can be more effective emotion regulation strategies (Harris, 1989; Harris & Lipian, 1989; Pons et al., 2004).

#### *1.2.3.8 Morality*

The morality component of EU is about children's understanding of people's negative emotional reactions to a morally reprehensible action, such as lying or stealing, in addition to the understanding that people have positive emotional reactions to a morally praiseworthy action, such as making a sacrifice or admitting a wrongdoing. This ability is present from approximately 8 years (Harter & Whitesell, 1989; Lake, Lane, & Harris, 1995). For example, Nunner-Winkler and Sodian (1988) studied 4- to 8-year-old children's attributions of emotion to a protagonist in a story who violated a moral rule (e.g. deliberately lied, pushed another child or stole something). The majority of the 4-year-olds judged the wrongdoer as experiencing positive emotions, focusing their justifications on the successful outcome of the

action, whereas almost all 8-year-olds attributed negative emotions (e.g. sad or bad) to him, focusing on the moral value of the wrongdoer's action.

#### *1.2.3.9 Mixed*

Harter and Buddin (1987) presented a five-level cognitive-developmental approach based on research across ages 4 through 12, describing how children's understanding of mixed emotions develops with age and depends on the emotion valence (positive or negative) and number of emotional targets (e.g. situation or person). According to their research, it is not until children are 11 years old that they can acknowledge they can feel a positive and a negative emotion at the same time, caused by one target. For example, you can experience both happiness and disappointment, both caused by receiving the same present for your birthday.

In Harter and Buddin's (1987) study, the children were asked to name emotion(s) and to describe a thing, person or situation (target) that would make them feel the emotions at the very same time. It seems possible that if demands on language and memory are reduced, younger children could acknowledge the existence of mixed emotions. For example, Kestenbaum and Gelman (1995) found that 4-year-olds could "read" mixed emotions when displayed on the face, but could not match the face to a situation. They were able to label mixed emotions, but were not mature enough to acknowledge the experience. The 5-year-olds could both label and link the experience of mixed emotions to an appropriate situation. However, other studies reducing the demands on memory and language have shown the same age pattern as described in the five-level model (e.g. Albanese et al., 2006; Larsen, To, & Fireman, 2007; Pons et al., 2004).

### 1.2.4 Summary

The overview presented in this section was of the normative development of EU. However, it is important to remember that the descriptions presented here are mainly based on research done in the US and England. As will be shown in a later section of this thesis, the age norms may differ as a consequence of culture or the child's socioeconomic status. Additionally, since we now know that there are substantial individual differences in children's EU, we need more knowledge to grasp why some children develop an advanced EU and others have a more limited EU. In the following section, an overview will be presented of the theories and research that describe and discuss different factors that impact the differences in children's EU. Because this thesis is about normative EU development, and mainly about causes of differences in children's EU, there will not be given an overview of problems with EU in clinical groups or with children having developmental delays or deficits (e.g. autism). In addition, while there has been an increased focus in the literature on the neurophysiological basis of developmental phenomena, it is beyond the scope of this thesis to address neurophysiological issues.

## 1.3 WHAT CAUSES DIFFERENCES IN CHILDREN'S EU?

During the last two decades there has been a number of studies of what has been labeled the *socialization of emotion,* especially the socialization of children's understanding, experience, expression and regulation of emotion (Eisenberg et al., 1998). Eisenberg et al. (1998) presented in their model four factors contributing to the socialization of children's emotion: 1) child factors (e.g. gender and temperament), 2) parent characteristics (e.g. parenting style and emotion beliefs), 3) cultural factors (e.g. emotion beliefs, norms and values) and 4) context (e.g. history of emotion-related interactions in the family). In addition, Denham (1998) divides the primary drivers of EU development into interpersonal (e.g. the quality of the

parent-child interaction) and intrapersonal (e.g. the child's gender) factors. The present thesis examined child factors, parent factors, cultural and sosioeconomic factors relevant for children's EU, and in the following section a short overview of research and theories on these topics will be presented.

### 1.3.1 Parent-child interaction

According to the *contingency hypothesis*, it is parents' emotional and behavioral way of responding to their children's emotions that teaches children to differentiate between emotions (Denham, 1998). Having parents who name, value and accept all types of emotions (positive and negative) and who create an emotional climate in which a child's emotions are addressed in a sensitive and non-hostile way is hypothesized to help the child learn about his or her own and other people's emotions (e.g., Eisenberg et al., 1998). There is a discussion in the literature about the value of parent-child interaction in the development of children's EU. Pons, Doudin, Harris, and De Rosnay (2005) describe two models (see Figure 1) of individual differences in children's EU, which are not mutually exclusive.

#### *1.3.1.1 The affective vs. the cognitive model*

*The affective model* (e.g. Fonagy & Target, 1997) emphasizes the emotional bond between the caregiver and the child. This line of thinking is described in the attachment literature as the crucial point the child needs to develop a secure *internal working model*. The internal working model is formed by the child interacting with a sensitive and responding parent. Some claim that the pathway of child attachment runs directly to the child's psychological understanding, and others pose a mediated pathway where the attachment status promotes different types of social encounters, which have an effect on the child's EU (Harris, 1999).

There are studies supporting this model that propose that the better the emotional wellbeing of the caregiver and the child, the better the child understands emotions. Some researchers have found a positive relationship between the child's EU and the child's attachment status, in which securely attached children display a better EU than the insecure (e.g. de Rosnay & Harris, 2002; Fonagy, Redfern, & Charman, 1997; Steele, Steele, Croft, & Fonagy, 1999).

The second perspective is the *cognitive model* (e.g. Harris, de Rosnay, & Pons, 2005). This perspective emphasizes the quality of the parents' and the child's symbolic and cognitive abilities as the most important factor affecting the child's EU development. Researchers have found positive relationships between caregivers' ability to talk about the nature, causes and consequences of different emotions and the children's EU (e.g. Brown & Dunn, 1996; de Rosnay et al., 2004; J. Dunn, Brown, & Beardsall, 1991; Ruffman, Slade, & Crowe, 2002; Taumoepeau & Ruffman, 2008). They have also found a positive relationship between enhanced child verbal and IQ skills and better EU (e.g. Albanese, De Stasio, Di Chiacchio, Fiorilli, & Pons, 2010; Bennett, Bendersky, & Lewis, 2005; de Rosnay & Harris, 2002; Denham, 2006; Denham, Zoller, & Couchoud, 1994; Pons et al., 2003).

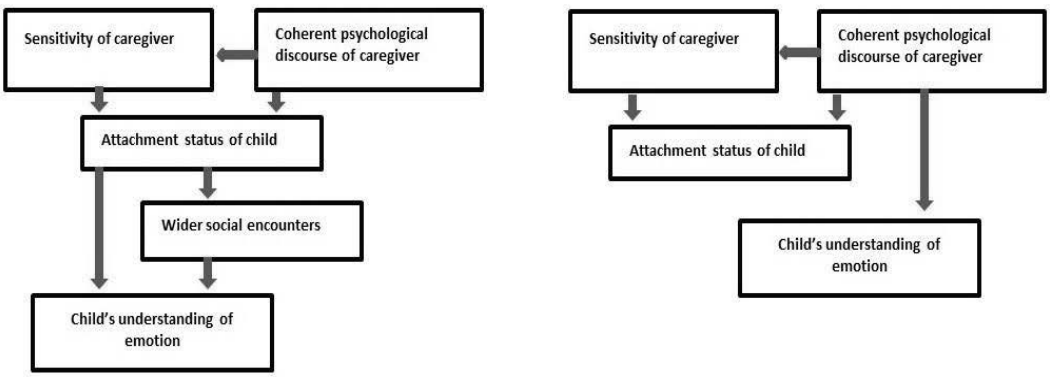


*Figure 1.* The affective model on the left, and the cognitive model on the right (Harris, 1999).

There are some studies that include variables from both the affective and the cognitive models in order to compare the impact these factors have on children's EU. For example, Fonagy et al. (1997) showed in a study of preschoolers and schoolchildren that a positive mother-child attachment was a good predictor of child EU, even after controlling for child verbal skills. However, Raikes and Thompson (2006) studied 3-year-old children and found that mother-child use of positive and negative emotion words in conversations remained a significant predictor of child EU, along with child verbal skills, but attachment security ceased to be a significant predictor of EU after including mother-child references to emotion. In addition, a study following children's theory of mind from 6 months to 4 years showed that children's verbal skills and parental mentalization, and not maternal sensitivity in the parent-child interaction, predicted the child's theory of mind performance (Meins et al., 2002).

The majority of studies testing the affective and cognitive models have assessed the attachment status of the parent-child relationship and not measured the quality of parent-child interaction. There are a few cross-sectional studies that have shown that the emotional quality of the parent-child interaction is related to better EU in the child (e.g. Denham & Grout, 1993; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997). Two studies have investigated the impact of parent-child interaction on the development of EU in a longitudinal study (Denham & Kochanoff, 2002; Denham et al., 1994). Denham and Kochanoff (2002) found that children's EU at ages 3 and 4 was predicted by mothers' positive observed emotions, attentiveness to their children's emotions and willingness to help their children address their emotions. The majority of studies examining the impact of parent-child interaction have used small research samples or measured only some components of EU, and the longitudinal studies have assessed different EU components at T1 and T2 and therefore not measured what contributes to the *development* of EU.

In Study II we included the quality of parent-child interaction as a predictor of change in EU from 4 to 6 years in a community sample, as one of the important variables in the affective model. We included the child's verbal skills as a covariate in Study II, and in addition we examined the impact of parental accuracy of mentalization (described in the next section).

### 1.3.2 Parental cognitions about children's emotions

In addition to the factors described in the affective and cognitive models, researchers have started to operationalize parents' *cognitions* of their children's emotions and thoughts and examine if these representations have an impact on children's cognitive development. Many concepts have been developed for describing and measuring parents' cognitions about their children from different "schools" or research traditions, highlighting various aspects. In the next sections a short overview will be presented of theories and ways of measuring parental cognitions relevant for the studies in the present thesis.

#### *1.3.2.1 Parental cognitions: mentalization and beliefs*

There are several concepts describing parental cognitions of their child's emotions and/or thoughts, such as *mind-mindedness* (Meins, 2013; Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins et al., 2003; Meins et al., 2002), *meta-emotion philosophy* (Gottman, Katz, & Hooven, 1996), *parents' beliefs about feelings/emotions* (Dunsmore, Her, Halberstadt, & Perez-Rivera, 2009; Dunsmore & Karn, 2001) and *maternal accuracy* (Sharp, Fonagy, & Goodyer, 2006). All these concepts describe parents' ability to value and understand children's emotions and/or thoughts, and some of the concepts also included the parents' understanding of or attitudes towards their own emotions. The importance of different aspects of parental cognitions for the child's EU has been outlined in several theoretical models (e.g.

Dunsmore & Halberstadt, 1997; Eisenberg et al., 1998) upon which the present thesis is based, especially the literature on *parental mentalization.*

Fonagy and Target (1996) introduced a developmental model of *mentalization* based on an integration of findings from research on attachment, theory of mind, social cognitions and emotion understanding. Mentalization is described as a form of imaginative mental activity about others or oneself, namely, perceiving and interpreting human behavior in terms of intentional mental states (e.g. needs, desires, feelings, beliefs, goals, purposes and reasons) (Fonagy, Gergely, Jurist, & Target, 2002). From this theory, there has been a focus on the impact of the parents' ability to mentalize the child's development of a theory of mind and EU. Slade (2005) argues that a parent with the ability to take the psychological perspective of the child would be better at holding, regulating and experiencing their child's emotions in a non-defensive way because they "read" the child's reactions accurately. This gives the child an area to practice their own mind-reading skills in the context of a supportive interpersonal relationship. Fonagy and Target (2006) argue that this is consistent with the earlier proposition by Vygotsky (1978) in which children's skills are scaffolded and practiced before they become a part of the intrapersonal repertoire.

#### *1.3.2.2 Measuring parents' cognitions*

The concepts about parental cognitions of children's emotions and thoughts are measured in different ways. Some are explicit measures (questions to parents, e.g. Parent Development Interview (Slade, Aber, Bresgi, Berger, & Kaplan, 2004)) and some are more implicit measures (observation of parent's behavior interacting with their child, verbal or non-verbal, e.g. Mind-Mindedness (Meins et al., 2001)). Some studies have examined *parental beliefs about children's emotions* in general terms using questionnaires, such as beliefs about ways to guide a child who is experiencing various emotions (Dunsmore et al., 2009) and children's developmental readiness to understand and talk about emotions (Dunsmore & Karn, 2001).

However, there are very few studies examining the impact of parents' cognitions of their child's emotions and thoughts on the child's EU. One study found that mothers who described their 4- to 6 year-old children in more mentalistic terms (e.g. references to the child's imagination, interests or meta-cognition) had children with more advanced EU (de Rosnay et al., 2004).

In Study I and II in the present thesis we introduced a parental measure using a methodology described by the general belief literature, in which there is a tradition of asking parents to estimate their child's abilities and comparing this estimate to the child's actual performance (Miller, Davis, Wilde, & Brown, 1993; Miller, Manhal, & Mee, 1991). This procedure is in accordance with the mentalization literature, in which one of the main aspects is the focus on the parents' ability to understand their child's emotional capacity (Sharp & Fonagy, 2008). We expected that parents need to know the developmental level of the child to be able to promote the child's development of EU in their own personal *zone of proximal development,* the concept introduced by Vygotsky (1978) about the difference between what a child can do without help and what he or she can do with help.

Some studies have shown that parents are quite accurate estimators of their children's cognitive and communication skills (Molina & Bulgarelli, 2012; Waschbusch, Daleiden, & Drabman, 2000). However, other studies indicate the opposite: that parents' estimates of their own child's abilities are only slightly more accurate than chance (Miller et al., 1993). It has been difficult to compare these results because of the different ages of the children involved and different outcome variables. In addition, the majority of the studies have compared the parent's total score (e.g. estimating the child's competence on a test) to the child's total score, and only a few studies have compared the child's actual score on each item to the parent's estimate. Our measure was a direct comparison of the child's actual item-level performance on a test of EU with the parent's ability to estimate the child's performance on a test of EU, which we have defined as the accuracy of parental mentalization. This measure was used both

cross-sectionally (Study I) and as a predictor of the change in children's EU from 4 to 6 years (Study II). In addition, we investigated possible factors that can be associated with parents' ability to accurately mentalize their child's EU.

#### *1.3.2.3 Correlates of parental accuracy of mentalization*

Previous research has found a positive relationship between parental accuracy and child competence (e.g. parental estimation of child IQ and verbal skills) (Miller, 1986; Miller et al., 1991). In Study I in this thesis, we examined the relationship between parental accuracy of mentalizing their child's EU and child EU and verbal skills. We expected that the more verbally skilled children are, the better they are at expressing their EU, and hence it is easier for parents to mentalize verbally skilled children's level of EU.

The quality of the parent–child interaction has also been suggested as a predictor of accuracy of mentalization, because sensitive and structuring parents are more likely to match their teaching efforts to their child's level of cognitive development. This assumption has been called the "match hypothesis" (Hunt & Paraskevopoulos, 1980). This has mainly been treated as a theoretical assumption, and the research on it is inconsistent; the studies that have found that more accurate parents are more sensitive in their interactions with their child are mainly from high-risk samples with infants. The accuracy measures have been based on the parents' knowledge about children's developmental milestones in general, and the studies have not compared the parents' estimate to the abilities of their own child (e.g. Fry, 1985; Stevens, 1984). Additionally, some researchers have not found any significant associations between parental accuracy and parental sensitivity in interactions with their children (Huang, Caughy, Genevro, & Miller, 2005). It may be that the quality of the parent-child interaction is more important for some aspects of children's cognitive development than others, and it is important to also include other possible explanatory variables in the same design. In Study I we observed the quality of the parent-child interactions, and we expected to find that more

accurate parents were interacting with their children in a more sensitive manner than inaccurate parents.

Previous studies have shown that parents' beliefs about their own and their children's emotions have an impact on the child's emotional adjustment (e.g. Gottman et al., 1996). Children with emotional or behavioral problems may be more difficult for parents to mentalize accurately. Some children may have problems talking about difficult emotions because of depressive or anxiety symptoms, and other children may behave in an inconsistent way that may confuse their parents' interpretation of their child's inner world. The relationship between parental accuracy and child mental health has been given little attention in the belief tradition, although one study found that mothers who poorly estimated their children's mental state also rated their children as having more symptoms of behavioral-emotional problems (Sharp et al., 2006). We examined the relationship between parental accuracy and child mental health in Study I.

Previous studies have found that parents with a low level of education can be as accurate as parents with a high education in estimating their children's academic level, such as child literacy and IQ (Delgadohachey & Miller, 1993; Korat, 2009). However, since no previous studies have specifically focused on parental accuracy of mentalizing children's EU, we included parental educational level in our model when comparing the impact of different factors on parental accuracy in Study I.

### 1.3.3 Child social competence

Social competence is the ability to use appropriate emotional and behavioral strategies to successfully engage in social interactions and maintain relationships with other people over time (Odom, McConnell, & Brown, 2008). Halberstadt et al. (2001) argue in their theoretical model *Affective Social Competence* (ASC) that children who are better able to understand emotional cues in the social environment develop superior social skills, and therefore form

positive interpersonal relationships to a greater extent than children with lower EU. For example, a child who *understands* that a friend is feeling afraid because they are playing a scary game will be in a better position to offer an empathic response to the child and attempt to include him or her in another game. Having well developed EU makes it easier to socially interact with other children, and children with good EU are often rated more popular and socially competent by friends, parents and teachers (Denham et al., 2003; Denham, McKinley, Couchoud, & Holt, 1990; Garner & Waajid, 2012; Hubbard & Coie, 1994; Rocha et al., 2015). In a longitudinal study (N = 143), Denham et al. (2003) found that better EU in 3- to 4-year-old children was associated with better social skills two years later.

The opposite effect – that better social skills may promote EU – is also entirely possible, although far less researched. Only one study has examined this hypothesis longitudinally. Dunsmore and Karn (2004) measured peer relationships and EU (N = 45) and found that at age 5 ½ popular children and children with more stable friendships manifested greater EU at 6 years than less popular children. Some researchers now suggest that the relationship between children's social competence and understanding of emotions is bidirectional during the preschool years (Banerjee, Watling, & Caputi, 2011; Hughes & Leekam, 2004).

A meta-analysis investigating children's EU and social competence found relatively consistent yet modest relations between EU and children's social skills (Trentacosta & Fine, 2010). In a recent meta-analysis, researchers examined findings from over 20 years of research on whether individual differences in children's ToM understandings are related to the quality of their peer relationships (Slaughter, Imuta, Peterson, & Henry, 2015). The results showed that children with higher ToM scores were also more popular in their peer group. The effect did not vary with age and was weaker for boys compared to girls. These results are relevant for the study of children's EU because the development of ToM lays the foundation

for e.g. the EU components Desire, Belief and Hiding. However, the meta-analysis presented by Trentacosta and Fine (2010) only examined a limited number of EU components. Therefore, we included social skills in our analysis (Study II) of predictors of development in children's EU. In Study II we regarded children's social skills as an interpersonal factor because the measure of social skills used in the study – the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) – mostly taps children's behavior directed towards peers. Study II expands the study by Dunsmore and Karn (2004) by investigating all nine components of EU in a large population with two years between T1 and T2.

### 1.3.4 Socioeconomic status

In a review of studies addressing the relationship between socioeconomic status (SES) and socio-emotional development, Bradley and Corwyn (2002) found little evidence of the effect of SES on very young children's emotional competence. However, studies of children from early childhood to adolescence have indicated that there is more frequent maladaptive social-emotional functioning in low-SES subjects than in high-SES subjects (Bradley & Corwyn, 2002). The majority of studies have been based on data provided by parents and teachers rather than by the subjects themselves, and socio-emotional competence has often been indicated by emotional problem scores on rating scales rather than by direct measures of children's EU.

There are very few studies that have included SES as a possible predictor of individual differences in children's EU. Some of these studies find a positive relationship between SES and better EU (Cutting & Dunn, 1999; J. Dunn & Brown, 1994), whereas other researchers report no effect of SES on preschoolers' EU (Molina et al., 2014). The majority of research on children's EU in general is dominated by middle-class samples from western, educated, industrialized, rich and democratic societies, which may not be representative populations from which to make generalizations (Henrich, Heine, & Norenzayan, 2010).

Because of the lack of studies investigating the whole range of EU components in children from non-Western countries, the present thesis presents a study (Study III) of Brazilian children's EU. In Brazil, educational contexts are clearly aligned with socioeconomic differences: children from the middle class and upward attend private day-care centers, and children from low-income families attend public day-care centers.

### 1.3.5 Culture

Do children from different cultures develop EU in a similar pattern, or does development vary depending on cultural differences? The culture in which the child grows up influences the way he or she expresses and experiences emotions (Friedlmeier, Corapci, & Cole, 2011). The factors described in the previous sections may differ when comparing cultures, e.g. parenting styles, the quality of attachment, the way parents talk about emotions, parental cognitions about emotions and the value of social competence.

Different emotion socialization practices have been associated with cultures valuing *independence* and *individuation* on the one hand and *interdependence* and *group-membership* on the other; these cultural values are often called individualism and collectivism, respectively. For example, Brazil, Thailand, Ghana, China and Peru are defined as collectivistic countries, and the United States, Italy, France, England, Germany and Norway are defined as individualistic countries (Hofstede, 1991). Collectivists are the individuals who view themselves primarily as parts of a whole, e.g. a family, a network of co-workers, a tribe or a nation. Families in collectivist cultures train children in dependent behaviors and teach children to engage in appropriate levels of relatedness – to have obedient, calm, polite and respectful behavior (Triandis, 1995). Individualists are motivated by their own preferences, needs and rights, giving priority to personal rather than group goals. The ties between people in an individualistic society are loose, and everyone is expected to look after him- or herself or her or his immediate family (Triandis, 1995).

Friedlmeier et al. (2011) describe the *individualistic emotion competence*, which is evident in the emotion coaching style of e.g. Euro-American parents. Parents who have this style are aware of and accept children's negative emotions, and they encourage the experience of such emotions, provide comfort and assistance and scaffold self-regulation of children's distress (Gottman et al., 1996; Gottman, Katz, & Hooven, 1997). Friedlmeier et al. (2011) also describe the *relational emotional competence* in e.g. East Asian countries, where parents emphasize knowledge of emotion display rules, teach the importance of interpersonal sensitivity and cultivate expression of "other-focused" emotions such as sympathy and shame.

Do these different emotion socialization styles affect children's EU? There is limited cross-cultural research on children's emotional development, and only a few studies have investigated children's EU in non-Western cultures and compared them to Western children (Avis & Harris, 1991; Gardner et al., 1988; Joshi & MacLean, 1994; Matsumoto & Kishimoto, 1983; Tenenbaum et al., 2004; Vinden, 1999). Some studies have compared EU in different Western countries (Albanese et al., 2006; Molina et al., 2014). Overall, the studies have shown that there are mostly similar developmental patterns; however, especially when comparing Western and non-Western populations, the rate of EU development may differ. For example, children from Cameroon and Papua New Guinea developed an understanding of Belief later than Western children (Vinden, 1999). In addition, Euro-American pre-schoolers scored higher than Chinese-American pre-schoolers in understanding that emotions are affected by external events or objects (External component) (Wang, 2008). In a study by Molina et al. (2014), Italian children scored higher than German children on EU at ages 3 and 5, and more Italian than German preschoolers understood that expressed and felt emotions may differ (Hiding component).

It is difficult to compare cross-cultural research on EU due to methodological differences and the fact that only a few of the nine components of EU are usually included.

However, using the same instrument allows the EU development of children from different cultures to be compared. Study III expands the knowledge of cultural differences in children's EU by comparing children from Brazil (collectivistic country) with studies of children from two individualistic countries (Norway and Italy) and one collectivistic country (Peru), assessing the nine components of EU with the same instrument.

## 1.4 Summary

According to this authors' knowledge, in Norway research has been conducted on only one of the nine components of EU: during the last thirty years, researchers at the Psychology Department of the Norwegian University of Science and Technology have published studies of young children's understanding of emotion regulation strategies (Regulation component) in both European journals (Endrerud & Vikan, 2007; Vikan et al., 2013) and Brazilian journals (Dias, Vikan, & Gravas, 2000; Vikan & Dias, 1996). The Test of Emotion Comprehension (TEC) is the first instrument translated into Norwegian that measures all nine components of EU, and the studies described in the present thesis are the first data on Norwegian children aged 4 to 6 years old regarding the nine components of EU.

There are both cross-sectional studies (e.g. Bennett et al., 2005; de Rosnay & Harris, 2002; J. Dunn & Brown, 1994; Dunsmore & Karn, 2001; Pons et al., 2003) and longitudinal studies (e.g. Brown & Dunn, 1996; Denham et al., 2012; Denham & Kochanoff, 2002; Denham et al., 1994; J. Dunn, Brown, & Beardsall, 1991; Dunsmore & Karn, 2004; Hughes & Dunn, 1998) on causes of differences in preschoolers' EU. However, few of the previous studies have investigated *change over time* in EU development. In addition, the sample sizes in the longitudinal studies have been rather small, with some exceptions (Denham et al., 2012; Denham & Kochanoff, 2002). Most of the longitudinal and cross-sectional research on EU has only examined one to three components of it, and the majority of the longitudinal

studies have included different methodologies when comparing children's EU at various time points in time. In the studies presented in this thesis we have used the Test of Emotion Comprehension (TEC), which assesses both easy and complex components of EU, and in the longitudinal study (Study II) we measured with the same method when assessing EU change from 4 years to 6 years.

Furthermore, the relationship between parental accuracy of mentalization and parents' emotional interaction style and children's EU is an understudied topic. We therefore included both these factors in two of our studies. In addition, there are studies reporting that parents socialize girls more towards emotion-related themes than boys (e.g. Aznar & Tenenbaum, 2015; J. Dunn, Bretherton, & Munn, 1987; Garner, Jones, Gaddy, & Rennie, 1997) and that girls aged 3 to 4 years perform better at EU tasks than boys of the same age (J. Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). We included gender as a covariate in Study II.

Finally, many of the cross-cultural studies have compared non-European children from low-SES populations to Western children from comparatively well-off middle-class-SES populations. The problem with this design is that SES may be a source of variation that is partly independent of culture, and effects of SES and culture maybe confounded. Therefore, we have chosen to examine EU in Brazilian children from different socioeconomic backgrounds. In addition, since the TEC is translated into many other languages, we parallel the Brazilian children with other samples from previous studies in European countries with different emotion socialization traditions, such as the Norwegian population from the Trondheim Early Secure Study.

## 1.5 AIMS OF THE THESIS

The overall aim of the current thesis was to examine the emotion understanding of children aged 3 to 6 years and its correlates and predictors.

In Study I we sought to determine:

1) *How accurate are parents in estimating the EU of their 4-year-old children?*
2) *To what extent is parents' accuracy of estimating their child's EU multivariately and concurrently associated with child and parental factors? Specifically, we examine associations between accuracy of estimation and children's actual EU performance, child verbal skills, parent-reported child mental health, parents' educational level and parents' emotional availability observed in parent-child interaction.*

In Study II we posed the question:

1) *What interpersonal factors predict an increase in child EU from age 4 to 6 years? Do parents' more optimal emotional availability (observed in parent-child interaction), parents' accurate mentalization capacity or child social skills reported by day-care teachers measured at 4 years of age contribute to a prediction of increased child EU two years later?*

The purpose of Study III was to:

1) *Examine to what extent variation in Brazilian children's EU is related to socioeconomic status.*
2) *Explore socio-cultural differences in EU by comparing the sample of Brazilian children's EU to the EU of same-age children from European (Italy and Norway) and non-European (Peru) countries reported in previous studies.*

# 2 METHOD

## 2.1 STUDY DESIGN AND PROCEDURE

This thesis includes three studies. The participants in Study I and II were from the sample of the Trondheim Early Secure Study (TESS) project (Wichstrøm et al., 2012), which is a longitudinal population study of early detection and prevention of psychiatric disorders. It was launched in 2007 and drawn from two birth cohorts of 4-year-olds, and is still an ongoing project. Study I was a cross-sectional study of the participating children (n = 882) 4 years of age (T1) and their parents. The study also included reports from the children's preschool teachers. Study II was a longitudinal study including data from T1 and assessing the children when they were 6-years old (n = 756) and their parents (T2).

In addition, we studied a sample of Brazilian children from the northeast of Brazil in a cross-sectional study (Study III) comparing two groups (low SES and high SES) of preschool children aged 3 to 5 years old.

### 2.1.1 Studies I and II

A letter of invitation was sent to all parents of two birth cohorts of children in Trondheim (approximately 200,000 inhabitants). To increase the variability in an age-restricted sample, we oversampled for children with social, emotional and behavioral problems, using the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) as a screening instrument in sample selection and recruitment.

The parents brought the completed SDQ to the community health check-up appointment that is routinely scheduled for all Norwegian 4-year-olds. Of the parents who were eligible for the study, 97.2% showed up for their appointments at one of the city's well-child clinics. Parents who were not sufficiently proficient in Norwegian to complete the SDQ screening were excluded from the study. A nurse at the clinic informed the parents about the

study and then obtained written consent from the parents to participate in the study (see appendix). Clinic staff missed asking a small percentage of the families (5.2%).

SDQ scores on the symptom scale (20 items) were divided into four strata: 0-4, 5-8, 9-11 and 12-40. With a random number generator, defined proportions of parents in each stratum (0.37, 0.48, 0.70 and 0.89, respectively) were drawn for participation in further studies. Figure 2 shows a flowchart of the sample recruitment.

At T1, parents were first interviewed with a semi-structured psychiatric interview (The Preschool Age Psychiatric Assessment (PAPA) (Egger & Angold, 2004)). The same parent that had filled in the SDQ at the health checkup attended a university clinic with their child (except in 14.1% of cases, in which the other parent attended instead). Parents were seated in a separate room filling out a questionnaire. Children were tested without their parents present, and parents granted consent to mail a questionnaire to the childcare provider who knew the child best in the day-care center they were attending (T1). After the child and parent were finished answering questions, the parent and child played together for 30 minutes, and this parent-child interaction was videotaped. The videotapes were later analyzed to measure the quality of the parent-child interaction with the Emotional Availability (EA) Scales, 3rd ed. (Biringen, Robinson, & Emde, 1998), which is described under the measures section. The play was divided into five tasks (Eyberg, McDiarmid, Duke, & Boggs, 2005): free play (10 minutes), child-led play (5), parent-led play (5), cleanup (max: 5) and child-waiting (i.e. not interacting with the parent) while the parent answered a questionnaire. Finally, while the child watched a movie in the same room as their parent while wearing headphones, the parent was asked to estimate their child's EU.

At T2, when the children entered first grade (i.e. two years later), the children and parents were invited back to the university clinic for a new assessment, following a similar procedure as T1. However, the parents did not estimate their child's EU at T2.

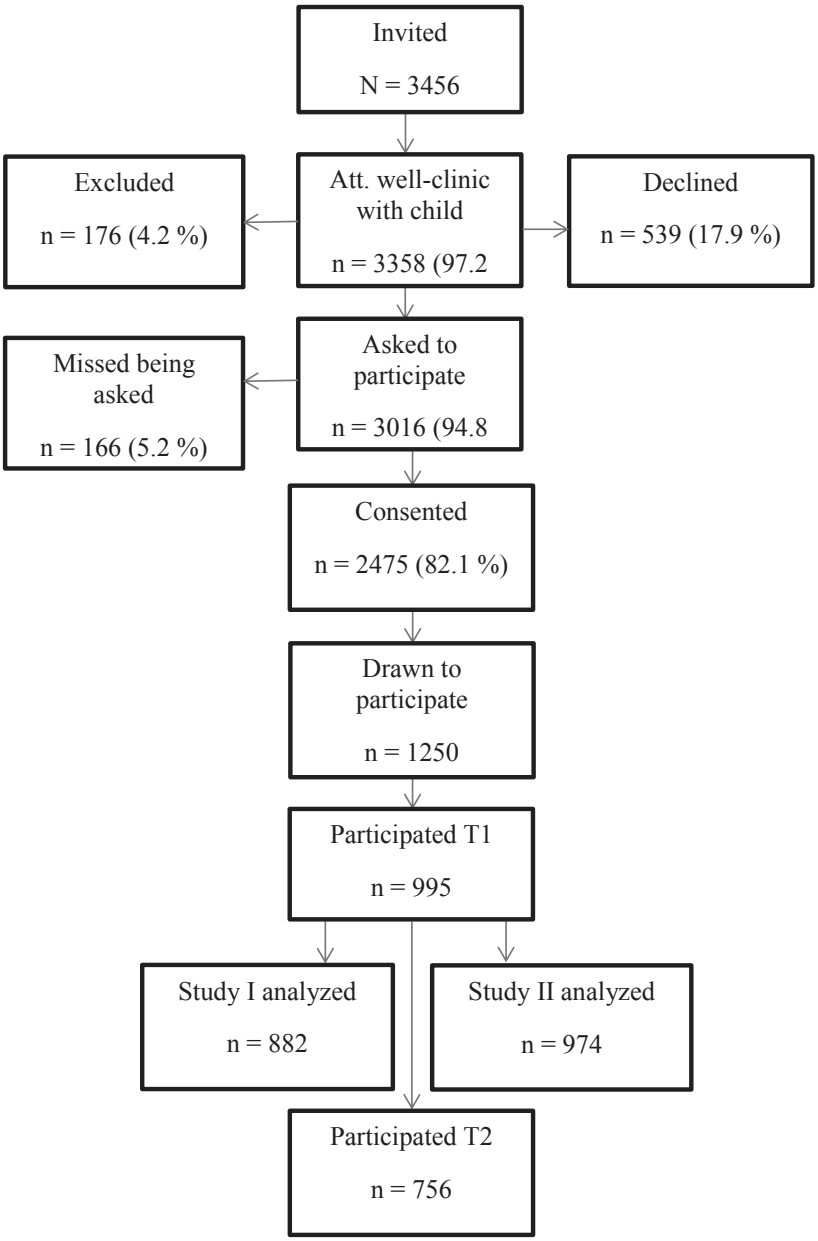


*Figure 2.* Flowchart of the sample recruitment for Study I and Study II.

#### *2.1.1.1 Attrition rate*

The attrition rate from T1 to T2 was 24% (n = 239). The sample that was analyzed in Study II (n = 756) was compared with the T1 sample with respect to the main study predictors and covariates. None of the study variables proved significant in predicting attrition from T1 to T2.

### 2.1.2 Study III

In Study III children from the city João Pessoa (approximately 720,000 inhabitants) in the northeast of Brazil (n = 100) were interviewed with a test of emotion understanding by two students in the graduate program in social psychology at the Federal University of Paraíba, Brazil. The students were supervised by the author of this thesis and a professor at the Federal University of Paraíba. Parents were asked for their children's participation through a consent form (see appendix) after permission was obtained from the day-care center leaders. In addition, assent was required from each participating child. The children were interviewed individually in separate rooms, and interviews lasted on average 15 minutes per child. Breaks were provided if the child felt tired. Each child received a small token in appreciation for their participation at the end of the interview. A socio-demographic questionnaire was administered only to parents of children in private day-cares (high SES) because the work hours of parents of children from low-income families restricted their ability to complete the questionnaires during preschool hours in the presence of a researcher. The Brazilian children's EU was compared to children's EU from studies in Norway (Study I), Italy (Molina et al., 2014) and Peru (Tenenbaum et al., 2004).

## 2.2 PARTICIPANTS

The participants in Study I were a sample of 882 4-year-olds. In this sample we included the cases in which we had a usable TEC score both from the child and the parent (estimated score of their child's EU), because the combinations of these two measures were the outcome variable of Study I. The mean age of the children was 53.0 months (range 46.3 to 63.0, *SD* = 2.1), with 442 boys and 440 girls. Of the participating parents, 84.8% were mothers and 15.2% were fathers (*M* = 35.07 years, *SD* = 5). Table 1 displays the participant characteristics in Study I.

Participants in Study II were a sample of 926 4-year-olds at T1 (464 boys and 462 girls), and 756 children were re-assessed after two and a half years (T2). The mean age of the children at T1 was 4.4 years (range 3.85 to 5.36, *SD* = .18) and at T2 *M* = 6.7 years (range 6.0 to 7.7, *SD* = .16). Nine hundred and seventy-four children had usable TEC measures at *either* 4 or 6 years and formed the analysis sample of Study II. Nearly every caretaker attending the clinic with their child (*M* = 35.1 years, *SD* = 5.0) was the child's biological parent (99.5%).

Table 1

*Participant Characteristics of Study I*

| Characteristic | | % |
|---|---|---|
| Gender of child | Male | 50.1 |
| | Female | 49.9 |
| Gender of parent informant | Male | 15.2 |
| | Female | 84.8 |
| Ethnic origin of biological mother | Norwegian | 93.0 |
| | Western countries | 2.7 |
| | Other countries | 4.3 |
| Ethnic origin of biological father | Norwegian | 91.0 |
| | Western countries | 5.8 |
| | Other countries | 3.2 |
| Childcare | Official daycare center | 95.0 |
| | Other | 5.0 |
| Biological parents' marital status | Married | 56.3 |
| | Cohabitating >6 months | 32.6 |
| | Separated | 1.7 |
| | Divorced | 6.8 |
| | Widowed | 0.2 |
| | Cohabitating <6 months | 1.1 |
| | Never lived together | 1.3 |

| | | |
|---|---|---|
| Informant parent's socioeconomic status | | |
| | Leaders | 5.6 |
| | Professional, higher level | 25.6 |
| | Professional, lower level | 39.9 |
| | Formally skilled worker | 25.2 |
| | Farmer/fisherman | 0.6 |
| | Unskilled worker | 3.1 |
| Households' gross annual income | 0–225' NOK (0–37' USD) | 3.3 |
| | 225'–525' NOK (38'–86' USD) | 18.4 |
| | 525'–900' NOK (86'–147' USD) | 51.6 |
| | 900' + NOK (147'+ USD) | 26.7 |

The participants of Study III were 100 children, with 50 in each SES group (private and public day-care centers). Public day-care centers in Brazil are fully financed by state governments, whereas private day-care centers are financed by the parents (families), and the costs are tax-deductible.

Low-SES children included 30 boys and 20 girls ($M_{age}$ = 4, *SD* = .57), and high-SES children included 16 boys and 34 girls ($M_{age}$ = 3.7, *SD* = .55). The high-SES group included a majority of biological mothers (92%), and 75.5% of the parents were married. Additionally, 56% of the parents had undergraduate degrees, and an additional 38% of the parents had completed high school. When we asked how well salaries covered the family's expenses, 74% answered very well, 26% answered well and none of the parents answered not well.

The samples from other studies of children's EU that were compared to the Brazilian sample were:

1) 882 Norwegian children ($M_{age}$ 4.4) (from Study I in this thesis),

2) 114 Italian children ($M_{age}$ 4.8) (Molina et al., 2014) and

3) 18 Peruvian children ($M_{age}$ 6) (Tenenbaum et al., 2004).

Table 2 shows the parents' level of education for the Brazilian high-SES children, Norwegian children and Italian children. We did not have educational information from the low-SES Brazilian and the Peruvian parents.

Table 2

*Parents' Level of Education (%) for the Brazilian High-SES Children, Norwegian Children and Italian Children*

| | Primary schooling | Secondary schooling | Higher education |
|---|---|---|---|
| Brazil High SES | 6 % | 14 % | 80 % |
| Norway | 7 % | 19 % | 74 % |
| Italy | 55 % | 33 % | 8 % |

*Note:* The classification is based on the Comparative Analysis of Social Mobility in Industrial Nations (CASMIN) classification (Braun & Müller, 1997).

## 2.3 MEASURES

Table A in the appendix shows a summary of the main instruments used in the current thesis, specifying whether a given measure was treated as an outcome variable, predictor or covariate in Studies I, II and III.

### 2.3.1 Emotion understanding

The Test of Emotion Comprehension (TEC) is designed for children aged 3 to 11 years to measure emotion understanding (EU) and is composed of nine components, divided into three developmental periods suggested by Pons et al. (2004). The TEC has been widely used in research and has been translated into 18 languages (Albanese et al., 2006; Molina et al., 2014; Pons & Harris, 2005; Tenenbaum et al., 2004).

In Studies I and II, children's EU was assessed using the Norwegian translation of the TEC (Pons & Harris, 2000) at T1 and T2. In Study III we used a Brazilian-Portuguese translation of the TEC (Roazzi 2007) with only minor adjustments. Both the Norwegian and the Brazilian-Portuguese translations were approved by the author, Francisco Pons. Both versions were first forward-translated and then back-translated by bilingual scholars, and tested with children in kindergartens to ensure that the concepts and procedures were comprehensible.

A short story accompanied by cartoon scenarios was read aloud to the child while the "faces" of the cartoon characters were presented without any features or expressions (i.e., a blank circle). At the story's end, the child was asked to indicate the emotional response of the story's protagonist by pointing to one of four cartoon faces expressing different emotions presented for this purpose, two displaying negative emotions (sad, scared; sad, angry; or scared, angry) and two non-negative emotions (happy, just alright). The TEC has separate versions for girls and boys and administration lasted for approximately 15-20 minutes.

The components (described in the Introduction from page 23) increase in difficulty and yield a sum score (range: 0-9), with a score of 0 or 1 at each component level. Recognition (component 1) and External (component 2) are assessed with five test items, and at least four of the five items must be answered to obtain score of 1. Desire (component 3) is assessed with four test items (all four must be answered correctly to obtain score of 1), whereas Belief (component 4), Reminder (component 5), Regulation (component 6), Hiding (component 7), and Mixed (component 8) consist of one test item each. Morality (component 9) is assessed with two items, and both must be answered to obtain score of 1.

Previous studies have shown that the nine components on the TEC are scalable [index of consistency $I = 0.68$ (Pons et al., 2004) and analysis by the Mokken scale also yielded satisfactory results, H = 0.40, Rho = 0.68 (Albanese et al., 2006)]. The alpha coefficient is often considered too strict as a lower-bound estimate of true reliability for dichotomous variables. Furthermore, the use of the alpha value alone is not advisable given the fact that the items on the TEC measure different components of EU and are not strictly parallel. Thus, we also calculated in Study 1 (using SAS macros) the upper bound of the reliability by the phi coefficient, which was .95. The use of this procedure has been discussed by Sun et al. (2007). In Studies II and III the Theta test was used to assess the reliability; it accounts for the categorical ordering of the data (Zumbo, Gadermann, & Zeisser, 2007) and overcomes some limits of Cronbach alpha (Gadermann, Guhn, & Zumbo, 2008). The Theta for the TEC was .82 at T1 and .91 at T2. Theta for the Brazilian sample in Study III was 0.85.

### 2.3.2 Parental emotional availability

Parental emotional availability indicates aspects of observed parent-child interaction. Videotapes of the interaction were scored with the Emotional Availability (EA) Scales, 3rd ed. (Biringen et al., 1998). The EA scales have been used in research in 20 countries (see e.g., Bornstein et al., 2012; Easterbrooks & Biringen, 2009; Sagi, Koren-Karie, Gini, Ziv, & Joels,

2002) with children from low- and high-risk populations (e.g. Oyen, Landy, & Hilburn-Cobb, 2000; Swanson, Beckwith, & Howard, 2000).

The EA scales are used to rate four parental dimensions (sensitivity, structuring, non-intrusiveness and non-hostility) and two child dimensions (responsiveness to and involvement with the parent). All dimensions are assessed in the context of the dyadic interaction, instead of being specific to the behavior of an individual child or parent. We used the total sum score of the four parental dimensions. The *sensitivity* dimension includes the emotional communication between the child and the parent regarding e.g. how they show interest and smiles and eye contact, in addition to parental warmth, comforting and playful contact. The *structuring* dimension is about how the parent supports the child's learning and exploration by providing rules, regulation and a framework for an interaction without overwhelming the child's autonomy. The *non-intrusive* dimension includes the parent's ability to be available to the child, without being interfering or overprotective. Finally, the *non-hostility* rating is about the covert or overt way parents talk and behave towards the child, which is generally pleasant, patient and harmonious.

The construct validity of the EA Scales has been examined in a variety of studies (Easterbrooks & Biringen, 2000, 2005). The four parent ratings in the present studies yielded an internally consistent score in our sample ($\alpha = .74$). All raters were trained and certified as reliable by Z. Biringen, who developed the EA. The inter-rater reliability between multiple blinded coders on a random 10% sample of the videotapes for the total parent scale was ICC = .71.

### 2.3.3 The accuracy of parental mentalization

The method of assessing parental accuracy has been extensively used in the research on parents' beliefs (Hirsjärvi & Perälä-Littunen, 2001; Miller, 1986; Miller et al., 1991). However, the studies in the present thesis are the first to assess parents' accuracy of mentalizing their child's EU. Previous research has investigated parental accuracy regarding e.g. children's

IQ (Delgadohachey & Miller, 1993), language skills (Korat, 2009) and attribution style (Sharp et al., 2006). The accuracy of parental mentalization was assessed at T1 and included in Studies I and II, and reflects the item-by-item correspondence between the parent's estimate and the child's actual response to each question on the TEC (range: 0-21). We first tested the child alone with the TEC. Subsequently, while the child was busy with something else, the parent was instructed to provide responses to the TEC *as if they were their child*. Because the accuracy of parental mentalization measure captures the agreement between parents and children *without considering the actual correctness of the child's response*, we chose to use all the items instead of the total score (0-9), which has been the usual procedure, because the total scores include scoring rules that depend on the correctness of the answer. This approach avoided the possibility of a parent generating an estimation score that exactly matched that of the child (e.g., 3/9) but incorrectly estimated all of the child's individual responses. Because parental accuracy is a difference score at the item level, while the child's TEC score represents the level across items, the two measures are conceptually independent.

### 2.3.4 Child social skills

Children's social skills were assessed by the total score on the 30-item Social Skills Rating System (SSRS) (Gresham & Elliot, 1990). There are both parent (SSRS-P) and teacher (SSRS-T) versions of this instrument, and we chose to use the teacher version because we wanted a multi-informant approach when assessing predictors of EU change in Study II. The SSRS is a widely used instrument and has been used in several studies as e.g. a screening device (see Frankel & Feinberg, 2002; Gresham, MacMillan, Bocian, Ward, & Forness, 1998) and a measure to assess treatment outcome (see Antshel & Remer, 2003; Sheridan, Dee, Morgan, McCormick, & Walker, 1996).

In the current study, we used a Norwegian version of the scale adapted and validated in Norwegian samples (Langeveld, Gundersen, & Svartdal, 2012; Ogden, 2003). The SSRS-T

yields a total score that gives an overall assessment of the child's social skills and includes the subscales of cooperation (behaviors such as helping others, complying with rules and directions and sharing materials), assertiveness (initiating behaviors such as asking others for information, introducing oneself and responding to actions from others) and self-control (behaviors that occur in conflict situations, such as responding appropriately to teasing, and in non-conflict situations, such as taking turns and compromising).

The SSRS has demonstrated good psychometric properties regarding reliability and validity (Frey, Elliott, & Gresham, 2011; Lyon, Albertus, Birkinbine, & Naibi, 1996; Muscara & Crowe, 2012; Van der Oord et al., 2005). In Study II the internally consistent score was $\alpha = .93$.

### 2.3.5 Verbal skills

The Norwegian version of the Peabody Picture Vocabulary Test (PPVT-III: L. M. Dunn & Dunn, 1997) was used to measure the children's verbal skills. This test is one of the most commonly used standardized tests of verbal skills, and it is a widely used in large-scale federally funded preschool research projects such as the Family and Child Experience Study (FACES) (e.g. Hammer, Farkas, & Maczuga, 2010) and the Early Childhood Longitudinal Study (e.g. Sénéchal & LeFevre, 2002).

The adaption was based on a pilot testing of 17 four-year-olds with the Norwegian version. A small number of alterations in the word order were made to ensure the words were introduced to the children with increasing complexity/difficulty.

The examiner presented a word that described one of four pictures on a page and asked the child to point to or say the number of the picture corresponding to the word. The test consisted of four practice items and 204 test items arranged in order of difficulty ($\alpha = .98$). The PPVT-III has proven good validity and reliability (L. M. Dunn & Dunn, 1997; Washington & Craig, 1999; Williams & Wang, 1997).

### 2.3.6 Parental SES

Parental occupational status was used as a proxy for SES in Study II, which is a common way to assess SES (Bradley & Corwyn, 2002; Shavers, 2007). The parent was interviewed about her/his occupation using the Preschool Age Psychiatric Assessment (PAPA) (Egger & Angold, 2004). Parental occupation data were coded according to the International Classifications of Occupations (I.L.O., 1990), yielding the following categories: unskilled workers, farmers/fishermen, skilled workers, lower professionals, higher professionals and leaders.

### 2.3.7 Parental education

In Study I information about parental education was obtained from the Preschool Age Psychiatric Assessment (PAPA) (Egger & Angold, 2004) interviews and measured on an 11-point scale that ranged from "did not complete junior high school" to "completed a doctoral degree".

### 2.3.8 Child mental health

The Norwegian version of the parent-reported Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) was used to assess child mental health. The SDQ has proved to be efficient in detecting psychopathology among both younger and older children (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000; Klasen et al., 2000; Malmberg, Rydell, & Smedje, 2003; Sveen, Berg-Nielsen, Lydersen, & Wichstrøm, 2013). The SDQ is a brief screening questionnaire for children and adolescents aged 4–16 years consisting of five five-item sub-scales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behavior. The total problem score (range: 0–40) is generated by summing the scores from all the scales except the pro-social scale. The SDQ has proven validity (Goodman, 1997) and reliability (Smedje, Broman, Hetta, & von Knorring, 1999). The internally consistent score of SDQ at T1 in the TESS project was $\alpha = .74$.

## 2.4 STATISTICS

Because we oversampled for mental health problems in Studies I and II, the data were weighted with a factor corresponding to the number of children in the stratum in the population divided by the number of participating children in that stratum (i.e. data for children with high SDQ scores were weighted down, and data for children with low SDQ scores were weighted up) to arrive at correct population estimates. The Complex Samples module in SPSS was used in Study I, whereas the weighting procedure in Mplus was used in Study II.

### 2.4.1 Study I

PASW Statistics 17 was used for the data analysis. Pearson's correlation coefficients were used to test associations between the predictor variables. We used Cohen's kappa (Fleiss, 1981) to measure the extent of inter-rater agreement between parents and children at the component level. Cohen's *d* was used to measure differences between parental estimates and child mean scores at the component level (Cohen, 1998). Multivariable correlates of parental accuracy in estimating child's emotion comprehension were examined by the General Linear Model (GLM) in Complex Samples.

### 2.4.2 Study II

Mplus 7.2 (Muthén & Muthén, 1998-2013) was used for the data analysis and a robust maximum likelihood estimator was applied, which yields robust standard errors. Missing data were handled according to a full information maximum likelihood procedure.

To examine the development of EU over time, a growth modeling approach was used. Growth was parameterized as yearly change. The residuals of TEC at ages 4 and 6 were set to zero, to be able to model growth with only two time-points. The factor loadings of the individual TEC components were examined with the model test procedure in Mplus.

To test predictors of growth in EU, the parameters of growth and intercept (EU at T1) were regressed on parental mentalization and emotional availability and child social and verbal skills, as well as gender and parental SES. These predictors and covariates were allowed to correlate. To adjust for potential regression towards the mean effects (e.g. some children could obtain high scores simply by chance by pointing to the correct answers), the slope was regressed on the intercept. Parental mentalization, parental emotional availability and child social skills were measured as latent variables. Because parental mentalization items were dichotomous (right or wrong), they were treated as categorical variables. However, this approach resulted in a frequency table for the latent class indicator model that was too large for Mplus to handle, so the $\chi^2$ could not be computed. Thus, common model fit indices (e.g. $\chi^2$, RMSEA, CFI and TLI) could not be computed.

### 2.4.3 Study III

IBM SPSS Statistics 20 was used for the data analysis. We used a two-way ANOVA on total TEC score with SES and age as two-level independent variables and an independent t-test to compare the TEC score at total and component levels. Cohen's *d* was used to measure effect size (Cohen, 1998), and Pearson's correlation coefficients were used to test associations between the components. We used a two-proportion z-test to compare the percentage of correct answers between different countries at the TEC component level and to compare the Brazilian children's responses at the item level.

## 2.5 ETHICS

Written informed consent was obtained from all of the parents in all three studies, and Studies I and II were approved by the Regional Ethical Committee for Medical and Health Research in Norway. Study III was approved by the Ethics Committee of the Health Sciences at the Federal University of Paraíba, Brazil.

# 3 RESULTS

## 3.1 Study I

### 3.1.1 How accurate are parents' estimations of their child's EU?

The findings from Study I showed that 91% of parents overestimated their children's EU. On average, parents estimated that their 4-year-old children would display the level of EU corresponding to a 7-year-old. Specifically, we found that parental average estimates of children's performance on TEC was $M = 6.50$ ($SD = 1.4$) and child average scores were $M = 3.35$ ($SD = 1.3$). Seven of the nine component items showed large differences between parental estimates and child scores. The kappa for inter-rater agreement between parents' accuracy and the children's actual scores at the component level was non-significant for six components and only moderately significant for the other three components, Desire, Belief and Regulation. The correlation between the children's actual TEC score and their parents'-estimated TEC score was low ($r = .14$, $p < .001$). Exploratory analyses showed that the variable of parental accuracy was normally distributed with a minimum of 1 and a maximum of 19 (range 0 – 21) and 7.5% of the parents had seven or less items correct. The average total level of accuracy was 12 out of 21 items ($M = 12.09$, $SD = 2.4$).

Subtracting the children's total TEC score (minimum 0 and maximum 9) from that of the parents' estimate of the child's TEC scores showed that 4.9% of parents matched their child's TEC score, and 4.1% of parents underestimated their child's TEC score. Of the 91% of parents who overestimated, 14.8% overestimated by one to two TEC points, 64.2% did so by three TEC points or more, and 12% did so by six TEC points or more. Table 3 shows the descriptive information of the children's and parents' estimated mean level of success of the TEC components.

Table 3

*Children's and Parents' Estimate Mean Level of Success of the TEC Components Scores (N = 882)*

| 4-year-olds' TEC scores (M) | | Parents' estimated TEC scores (M) | |
|---|---|---|---|
| Recognition | (.89) | Recognition | (.95) |
| External cause | (.49) | External cause | (.93) |
| Desire | (.38) | Desire | (.71) |
| Belief | (.20) | Belief | (.63) |
| Reminder | (.35) | Reminder | (.82) |
| Regulation | (.30) | Regulation | (.48) |
| Hiding | (.43) | Hiding | (.83) |
| Mixed | (.25) | Mixed | (.70) |
| Morality | (.09) | Morality | (.48) |

### 3.1.2 Variables associated with parental accuracy of mentalization

Accuracy of parental estimation was associated with their child's high performance on the TEC, advanced child verbal skills and more optimal parent-child interaction. Parents' educational level and parent-reported child mental health did not contribute to the variation in parental accuracy when compared with the other variables. Parental accuracy of estimation and children's high performance on EU were highly correlated ($r = .68, p < .01$), whereas parental accuracy and child verbal skills were moderately correlated ($r = .38, p < .01$). Collectively, the alleged correlates explained 51% of the variance in parental accuracy. The main proportion of this variance was due to children's actual EU.

## 3.2 Study II

### 3.2.1 The development of EU and correlations

Overall, children's EU increased significantly over two years; the mean EU score almost doubled by T2 ($M_{EU\ 6\ years} = 5.92$, SD =1.43) and the growth parameterized as yearly change ($M_{growth}$) was 1.28, $p < .001$.

The correlations among the study variables showed that EU at T1 and T2 were modestly positively correlated ($r$ =.16, p< .001). Parental mentalization (measured at T1) was related to better child EU, with associations larger at T1 ($r$ =.81, p< .001) than at T2 ($r$ =.20, p< .001). Additionally, greater verbal skills at T1 were associated with higher EU at T1 ($r$ = .40, p< .001) than T2 ($r$ =.18, p< .001). Increased parental emotional availability at T1 was associated with higher EU at T1 ($r$ =.14, p< .01), but there was not a significant association at T2 ($r$ =.06, n.s.). Better social skills (measured at T1) were related to greater EU at T2 ($r$ =.20, p< .001) but not at T1 ($r$ =.04, n.s.).

### 3.2.2 The impact of the predictor variables for increase in EU from ages 4 to 6

After adjusting for child gender, EU at age 4 (T1) and parental socioeconomic status, three variables at T1 each uniquely predicted growth in EU: better child verbal skills ($\beta$=.07, $p$=.01), social skills ($\beta$=.10, p <.05) and better parental mentalization capacity ($\beta$=.16, $p$=.02). Collectively, the alleged predictors explained 51% of the variance in EU growth from T1 to T2, but it should be noted that the greatest contributor to this explanation was the intercept of EU (i.e. EU at age 4). Efforts to determine whether effects of parental accuracy of mentalization were moderated by levels of verbal skills, social skills and parental emotional availability revealed no significant interaction effects.

## 3.3 Study III

### 3.3.1 Comparing the EU of Brazilian children from low- and high-SES families

We found that Brazilian children aged 3 to 5 years from high-SES families ($M$ = 3.14) had higher scores than the children from low-SES families ($M$ = 1.94). The older children ($M$ = 2.78) performed better than the younger children ($M$ = 2.03). The high-SES children performed better than the low-SES children for the components Recognition, Desire and Reminder. The largest difference was for the component Recognition ($d$ = 0.82). Our results indicated that the low-SES children more easily recognized negative emotions (sad, scared and angry) than positive (happy) and neutral (just alright) emotions.

### 3.3.2 Comparing Brazilian children's EU to the findings from studies of same-age children from other countries

When comparing the Brazilian children with previous study samples from Italy, Norway and Peru, we found that the high-SES Brazilian children showed similar responses at both the component and total levels as children from Italy and Norway. Additionally, the results

showed a lower percentage of correct answers at the component level and total means for the two samples of the Quechua children from Peru and the low-SES children from Brazil.

We found some differences at the component level; for example, the Norwegian children were better than the high-SES Brazilian sample on Recognition (88 vs. 70, $p < .01$) and External (49 vs. 26, $p < .01$), and the high-SES Brazilians performed better than the Norwegians on Reminder (54 vs. 35, $p < .01$). Additionally, the Italian children performed better on External (57 vs. 26, $p < .01$) and Hiding (55 vs. 32, $p < .01$) than the high-SES Brazilians, and the high- and low-SES Brazilians acknowledge Mixed emotions better than the Italians (32 vs. 15, $p < .05$).

# 4 DISCUSSION

## 4.1 Parents' overestimation of their children's emotion understanding

The results of Study I showed that 91% of parents overestimated their child's emotion understanding (EU), and that they considered their 4-year-old to have a level of emotion understanding that is characteristic of a 7-year-old. The average total level of accuracy was 12 out of 21 items. Parental overestimation has been found in other studies regarding other child competencies (e.g. language and IQ) (Delgadohachey & Miller, 1993; Miller et al., 1991). However, the explanation for the overestimation has not been widely discussed.

### 4.1.1 Part of natural emotion socialization

It may be that parents' overestimation found in Study I simply reflects the way in which parents naturally socialize their children's emotional development by prematurely interpreting and naming emotions, thereby guiding their children to develop their EU. Literature on children's language development often uses the concept "overinterpretation", which denotes parents' tendency to treat their child as if they have more advanced language skills than is actually true (Lock, 1980). Miller (1995) argues that parents who make optimistic attributions about their children's abilities will most likely persist in helping their children to overcome problems. According to Vygotsky's (1978) *zone of proximal development*, it is positive for children's development to be challenged by a more skilled person (e.g. the parent) in order to attain a higher level of development than the child can manage on their own. If the parental overestimation found in Study I "includes" the parents' explicit or implicit view of their child's potential, perhaps this is within the child's zone of proximal development. However, if the parents really believe this is the child's actual comprehension, then the three years of discrepancy may have a negative effect on the parents' socialization of the child's emotions. In the daily interactions between children and their parents, there are many situations that

require communication and understanding of the children's emotional reactions. If parents have too-high expectations of their child's level of EU, this may lead to misinterpretation of the child's reaction, which can cause distress for both the child and the parents. The way parents were asked to estimate their children's EU in Study I was very concrete and the parents knew the child had been given the same test. This suggests that it was unlikely that the parents' responses were about their children's potential instead of what they thought their child had answered.

### 4.1.2 Experience vs. understanding

Table 3 (page 66) in the results section of this thesis showed that the parents overestimated all of the EU components. There are two components that stand out when comparing the effect sizes. The parents had a very high estimated score on the component Mixed (parents .70 vs children .25). This is supposed to be a difficult component for the majority of 4-year-olds, as described in the introduction. Children at a very young age may very well show that they *experience* mixed emotions, but that does not imply that they also *understand* what they are feeling. Accordingly, parents' may possibly assume that *experiencing* an emotion is synonymous with *understanding* it. This important difference that Harris (1989) has emphasized may be a plausible cause of the large discrepancy found regarding several of the components. At age 4 the majority of children talk about emotions and have many emotional reactions during the day. It is therefore not unlikely that they can give the impression of understanding more than they actual do. For example, as shown in the introduction, that children as young as 2 years old can show the "correct" emotion (smile) and hide the actual felt emotion (disappointment) without having a consciousness of their "hiding" behavior (Gross & Harris, 1988),

On the other hand, the parents' estimation of the component Regulation (.48) was fairly similar to the children's score (.30). This component is the only one that describes the

child's behavioral strategies instead of emotions as a response to a story with emotional content. This component was not about an emotion the child "experienced" or "expressed". This might be the reason why the parents' confusion between the child's experience and the child's understanding of emotions was not present to the same extent. Additionally, children's emotion regulation is one of the components of EU that is often emphasized both in media and in the parenting literature making it easier for parents to grasp.

### 4.1.3 Measurement bias

It also cannot be ruled out that overestimation may be due to a measurement bias. Parents in Study I may have forgotten or misunderstood that they should answer exactly how they thought their child had responded. During the TEC interview the parent was reminded to answer as if they were the child by saying the child's name (e.g. what would Lisa have answered here?). Unfortunately, in the interview, we did not ask the parents to explain their way of answering. Had we done so, we could have obtained information about their motives for responding as they did.

### 4.1.4 Different ways of assessing parental accuracy

In Study I we combined different methods of assessing accuracy of parental estimation. We compared the parent-estimated Test of Emotion Comprehension (TEC) sum score with their children's actual TEC sum score and found a lower correlation than has been commonly reported in the literature on parental accuracy regarding other cognitive skills (e.g. Molina & Bulgarelli, 2012; Waschbusch et al., 2000). One explanation could be that parents find it more difficult to estimate their child's EU than e.g. verbal skills or other intellectual abilities. It may be that parents are more used to discussing and reflecting upon children's verbal and intellectual skills, which might be more apparent in their children's behavior, as opposed to the understanding of emotions, which can be more covert.

However, a parent could have an overall estimation score that exactly matched that of the child, but incorrectly estimated all of the child's individual responses. Because of this, perhaps it is more correct to interpret the accuracy measure based on item comparison. This showed that parents were correct on average for approximately 50% of the items. Similar results to those found in Study I using the same item-by-item comparison have been found regarding parents' estimation of children's attributional response styles (Sharp et al., 2006). Sharp and colleagues (2006) divided their accuracy variable into three groups and found that if the parent's accuracy was higher than the 25$^{th}$ percentile (correct on more than 4 out of 15 items), this was good enough for the child's psychosocial adjustment. Comparing these results with the accuracy of the parents in Study I, only 7.5% of the parents were below the 25$^{th}$ percentile. The study of Sharp et al. (2006) was with older children (7-11 years) and not about EU. However, in Study I we found no relationship between parental accuracy and child mental health. This indicates that parental overestimation was not associated with more emotional or behavioral problems for the children. Also, parents' knowledge about their children's EU was equally difficult to infer, irrespective of the child emotional and behavioral problems. However, as will be discussed in the next section, children may benefit cognitively from having parents that are good at estimating their EU.

## 4.2 Child and parent factors associated with parental accuracy of mentalization

Study I showed that the more accurate parents were in estimating their children's level of emotion understanding, the better the children understood emotions and the better their verbal skills, and that these parents were more sensitive in interacting with their children.

### 4.2.1 Four possible explanations

The results of Study I support a common finding in the belief literature that the more accurate the parents' estimates are, the more competent the child is (Chamorro-Premuzic, Arteche,

Furnham, & Trickot, 2009; Furnham & Valgeirsson, 2007; Miller, 1988). In a review of studies of beliefs about cognitive development, Miller (1988) suggests four possible explanations for these findings.

The first is the "overestimation bias", in which parents of bright children are more accurate because parents in general are very optimistic about their children's abilities. If this is the correct explanation, it may be that the large positive correlation between parental accuracy and children's EU competence found in Study I was a result of the fact that the majority of parents overestimate.

The second explanation is the "match hypothesis" (Hunt & Paraskevopoulos, 1980), which proposes that parents who have an accurate view of their children's abilities are better at matching their teaching efforts and structuring the child's environment in a way that fits the child's cognitive level. It is also in accordance with the mentalization tradition, which emphasizes that because the parent is good at taking the psychological perspective of the child, the parent is better at holding, regulating and experiencing their child's emotions in a non-defensive way. Hence, this makes parents capable of "reading" their child's reactions more accurately, which would have a beneficial influence on the child's own mentalization capacity (e.g. EU) (Sharp & Fonagy, 2008; Slade, 2005). The results from Study I indicated, even though the effects are not large, that being good at mentalizing the child's EU was associated with better quality of the parent-child interaction. This positive relationship may be interpreted in different ways. Because Study I was a cross-sectional study, we are not able to infer any causal explanations from our positive associations. Our results could be explained by the "match hypothesis", indicating that parents' ability to be sensitive and responsive interaction partners for the developing 4-year-old is positive for the child's EU.

However, it could also be the other way around: the child's EU competence could make it easier for the parents to mentalize accurately. Miller's (1988) third possible

explanation is that a positive association between the parents' accurate estimate and the child's competence could be due to the child's level of maturation and competence; a bright child is easier for parents to evaluate than a child with less competence. We also found a moderate positive association between parental accuracy and child verbal skills. This may support the notion that a bright child is easier to "read" and that children with more advanced language skills also show better EU, as has been found in previous studies (Cutting & Dunn, 1999; de Rosnay & Harris, 2002; de Rosnay et al., 2004; Pons et al., 2003).

Finally, Miller's fourth explanation is that the positive association is a result of advanced parental cognitive skills, which increases their accuracy of estimation merely because such parents are likely to have children with similarly advanced cognitive abilities. While we did not directly measure parents' cognitive abilities, the participating parents' educational level was not a predictor of parental accuracy of mentalizing their child's EU. This may weaken Miller's fourth hypothesis that parental cognitive abilities are the main contributor to the positive association.

## 4.3 The impact of parental accuracy of mentalization and emotional availability on children's development of emotion understanding

In Study II, the results showed that 4-year-old children who had parents with better mentalizing capacities advanced more in their development of emotion understanding (EU) from ages 4 to 6. This result showed that the new measure of parental accuracy of mentalizing introduced in this thesis also served as a predictor of EU development, in addition to being correlated with children's EU at both 4 years and 6 years. There has not been any previous research examining the impact of parental accuracy of mentalization their child's EU on child EU development. For the first time an accuracy measure was used as a predictor of EU in a longitudinal design.

During the period from 4 to 6 years the majority of children develop the most important components of EU (e.g. the Belief component, which is important for empathy), and by the end of this period children are expected to have developed 6 of the 9 components in the external and mentalistic periods (Pons et al., 2004). The results of Study II showed that the children who have the largest change in EU have parents that are good at mentalizing their child's EU. In Study II we controlled for the child's initial EU at T1 and therefor removed that alternative "overestimation bias" as an alternative explanation to the positive relationship between parental accuracy and children's EU development.

The accuracy measure used in this study consisted of a direct comparison of a child's EU and its parents' mentalization of that EU, both were assessed with the same measure. Such a procedure is more concrete than e.g. asking parents "Can you describe [child's name] for me?" as has often previously been used in studies of parental mentalization and child EU (e.g. de Rosnay et al., 2004). A parent may have an advanced mentalizing language, yet that may not necessarily be the most pertinent and fitting charaterization of their *child's* actual mental world. In addition, socially desirable responding (parents reporting that their child performs better than she/he actually does) reveals the discrepancy between parental beliefs or wishes and the child's actual performance.

According to the *affective model* (e.g. Fonagy & Target, 1997) and the *contingency hypothesis* (Denham, 1998), it is important for the child's EU development that she/he has a sensitive and responding parent. The results of Study II did not lend strong support to the affective model; good parent interaction with their child as observed during 30 minutes did not predict EU *development* from 4 to 6 years. This finding indicates that it is not the parent's sensitivity and non-hostility that is crucial for developing EU skills during the period from 4 to 6 years.

Because parental sensitivity has been measured with different instruments, it is difficult to compare studies examining the relationship between parental sensitivity and child EU. It could be argued that our sensitivity measure (Emotional Availability Scale) was not targeting the quality of the emotional communication between the parent and the child. We did not specifically measure parents' ability to teach children to differentiate between emotions or how the parents valued both positive and negative emotions as described as important for the EU development by e.g. Denham (1998). Maybe we had found a different result if we had analyzed the emotional content of the parent-child interaction more specifically. It also cannot be ruled out that the lack of effect of parents' emotional availability may be a measurement effect. Parental emotional availability was rated after seeing a 30-minute videotaped interaction. Many parents may show socially desirable parental behavior within that time span, but behave otherwise while not being observed.

A few longitudinal studies have examined the impact on child cognition of parental mentalization compared with parental sensitivity in the interaction (Meins, Fernyhough, Arnott, Leekam, & de Rosnay, 2013; Meins et al., 2002). Meins et al. (2013) found that mothers' mind-related comments (referring accurately to the child's thoughts or emotions) measured during parent-child interaction, and not parental sensitivity and responsiveness during free play with the child (both measures assessed at 8 months), were positively associated with the child's theory of mind at age 4. Even though this is with younger children and not measuring EU it indicates the same finding as in our Study II.

We found that verbally competent children had a more positive increase in emotion understanding than less verbally competent children. This give some support to the *cognitive model* (e.g. Harris, de Rosnay, & Pons, 2005), which emphasizes the quality of the parents' and the child's symbolic and cognitive abilities (Pons et al., 2005). Study II did not show how parental accuracy of mentalization or beliefs can be "transferred" to the child through

types of behavior other than being sensitive and responsive in parent-child interactions, as measured with the EA scales. Since EU is defined as a cognitive ability (Harris, 1989; Saarni, 1999) it is quite likely that it is also fostered by the parents' cognitive ability to verbalize emotions, as has actually been documented in some studies (Aznar & Tenenbaum, 2013; J. Dunn, Brown, & Beardsall, 1991; Farrant, Maybery, & Fletcher, 2013).

## 4.4 Child social skills as a predictor of EU development

The results of Study II showed that during the transition from preschool to school, the children who were more socially competent developed EU faster than the children with less social competence. This is the first study to show social skills as a predictor of change in EU during the preschool period.

The majority of previous theories and research have focused mainly on the importance of EU competence to develop social skills (Denham et al., 2003; Denham et al., 1990; Garner & Waajid, 2012; Halberstadt et al., 2001; Hubbard & Coie, 1994). But Study II showed that the opposite effect also was important. Our results indicate that there may be a bidirectional relationship between children's EU and social skills during the preschool years (Banerjee, Watling, & Caputi, 2011; Hughes & Leekam, 2004). Children that cooperate well with other children, show assertiveness and self-control have the best conditions to practice their EU skills.

We treated children's EU as a measure including all nine components. However, previous studies have shown that some aspects of EU may be more related to social skills than others. For example, Garner and Waajid (2012) found in a group of 3- to 5-year-olds that situation knowledge (the situations that elicit emotions), and not expression knowledge (knowledge of basic facial expressions, similar to the Recognition component in TEC), was associated with children's social competence. A recent study of children from Portugal aged

8-11 years using the TEC showed that only the components Belief, Hiding and Mixed were associated with social skills (Rocha et al., 2015). Perhaps we could have examined the associations of EU with social skills using mean component scores in addition to the total sum score, which included all nine components.

Even though we found that children's social skills at 4 years were a predictor of positive *development* in children's EU from 4 to 6 years, our results only showed a positive association between children's social skills at 4 years and the children's EU score at 6 years, not one between social skills at 4 years and EU at 4 years. These results indicate that being socially skilled at 4 years does not have a strong connection to having advanced EU at 4 years. Previous studies have found a positive association between social skills and EU at 5 ½ years (Dunsmore & Karn, 2004) and also at 3 to 4 years (Denham et al., 2003). However, the association in Denham et al.'s study (2003) was small. One explanation for not finding a positive relationship between child social skills and child EU at age 4 could be that we have based our assessment of social skills on day-care teachers' reports on interactions with children and adults in the day-care setting. Perhaps the social skills of younger children are better assessed by examining relationships with parents and siblings before children enter school. This suggestion is reviewed in a recent paper by Kramer (2014), which summarizes both theories and research showing that young children's EU is enhanced by resolving sibling conflicts and experiencing positive sibling engagement, in addition to practicing social skills in the triangulation of the child, sibling and parent relationship.

Some studies assess the child's own rating of their social skills, ask friends for a peer rating or observe the social skills in a naturalistic setting. Rocha et al. (2015) compared different ways of assessing social skills and found that peer assessment was most highly associated with the child's total EU score as measured with the TEC, followed by self-evaluation and teachers' reports. Since we found a positive relationship between child EU

development and social skills using teachers' reports, it could have been useful to compare whether the way of assessing social skills would have led to an even stronger impact of social skills.

## 4.5 The impact of SES on Brazilian children's EU

In Study III we examined EU in Brazilian preschool children, where there are substantial differences in SES between the middle and upper classes on the one hand and the lower class on the other. We found that high-SES children performed better at both the overall and component levels of EU than the low-SES sample. Some previous cross-sectional studies in Western countries have found SES differences regarding children's EU (Cutting & Dunn, 1999; J. Dunn & Brown, 1994). However, a recent study in Germany and Italy using the TEC did not report an effect of SES on preschoolers' EU (Molina et al., 2014).

In Study III, we reported that in particular the recognition of emotion (Recognition), the understanding of the effects of desires (Desire), and past information on emotions (Reminder) were more difficult for the low-SES Brazilian children to comprehend. As shown in the introduction, a high proportion of the children should to be able to recognize primary emotions at ages 3 to 5, and Study III showed that only 32% of the low-SES children (versus 70% of the high-SES children) were able to get a correct score on the Recognition component.

One explanation for the lower overall EU scores in the low-SES Brazilian group compared to the high-SES Brazilian group may be that the way the TEC assessed EU in children was easier for the economically advanced children. Purcell-Gates (1996) showed that low-SES parents tended to do more shared reading and explicit literacy instruction only after children entered elementary school. If this is so, and low-SES children look in books less often, they should possibly also have more difficulties in recognizing emotions when they are

shown drawn faces in a test booklet. Hence, if low-SES Brazilian children were shown pictures of "real" people, or had observed live faces showing all the emotional expressions as well as tone of voice and body language, they may possibly have performed better on the emotion recognition task. Previous research may support this assumption, since it has documented that children raised in poverty hear fewer conversations and less talking in general than children in middle-class homes, and hence they also have lower scores on vocabulary tests (Hart & Risley, 1995). Because of this, limited experiences with literacy in the preschool years may lead children to have difficulty in responding to decontextualized tasks, such as those seen in vocabulary measures, and also the TEC, which requires them to listen to an adult and point to pictures.

In addition, we found that the low-SES Brazilian children had more problems identifying positive and neutral emotions than negative emotions. One somewhat sad hypothesis may be that low-SES children are simply more familiar with negative emotions than positive ones, e.g. birthday presents have been more of a disappointment than something to be happily surprised about. The findings in earlier studies are divergent concerning the developmental maturing of positive and negative emotions. Some researchers suggest that the recognition of happiness develops earlier than the recognition of emotions like anger and sadness (Felleman, Carlson, Barden, Rosenberg, & Masters, 1983; Reichenbach & Masters, 1983), while Izard (1971) found that children recognize anger at the same time as happiness.

We found that the high SES and low SES Brazilian preschoolers had similar mean scores on the Belief, Hiding and Mixed components which could indicate that they develop independently of SES status. These are components are from the mentalistic (Belief and Hiding) and reflective (Mixed) periods (Pons et al., 2004). The mean score on these components was as expected for their age, and even higher than the norm for the Mixed component.

## 4.6 Cross-cultural comparison of children's EU

Because the TEC has been translated and adapted to different languages, we were able to do some tentative comparisons of children's EU from different cultures in Study III. Overall, our comparison indicated that the EU responses from high-SES Brazilian children (living in a collectivistic culture) were similar to those of children in European countries (from two individualistic cultures, Norway (Study I) and Italy (Molina et al., 2014)), both in the overall score and at the component levels of EU. However, the low SES-Brazilian children showed poorer performance than the Norwegian and Italian children on five of the nine components, and showed the same pattern of low scores as the Peruvian low-SES sample (a collectivistic society) on the majority of the easiest components (Recognition, External, Reminder and Desire) (Tenenbaum et al., 2004).

The Norwegian children were better than the high-SES Brazilians on the component Recognition (recognizing emotions on the basis of expressive cues). Since we have not studied TEC differences between many different cultures, it is difficult to say if this difference is substantial (70% vs. 89%). Additionally, the Norwegian children were somewhat older than the Brazilian high-SES children (M = 4.4 vs. 3.7), which could be a plausible explanation for this difference.

Both the Norwegians and the Italians scored higher than the Brazilians (high- and low-SES) on the component External (understanding that their emotions are affected by external events or objects). The low score on the External component for the high-SES Brazilians may be attributed to misinterpretation of the interview material. The stimuli material was about waiting for the bus, and the correct feeling corresponding to this situation was a "normal" feeling, whereas the Brazilian children responded with "sad". Many of the middle-class children in Brazil do not take the bus, and the bus is also very often late. Even though we added the information about the bus *being on time* in the administration of TEC, this may

possibly still have been ignored. In addition, the high-SES children may have responded with sad instead of normal because they had to take a bus in the first place instead of being driven, as is usual for high-SES children in Brazil.

The Italian children had better at understanding than the Brazilian high-SES children of the differences between outwardly expressed emotion and actual, inwardly experienced emotion (Hiding). Previous research comparing Italian children to German children (both individualistic countries) also revealed that Italian children are better at Hiding (Molina et al., 2014). Italians are well known for being highly emotionally expressive and displaying anotheremotion socialization than the Germans (Molina et al., 2014). Perhaps Italian children learn early that what is expressed outwardly may not correspond to the actual emotions that lie below the surface, e.g. an outburst of annoyance.

Overall, the cultural differences go both ways: on some components the Italians or Norwegians performed better than the high-SES Brazilians, and on other components the pattern was the opposite. For example, the high-SES Brazilian children performed better than Norwegian children on Reminder (understanding of the relationship between memory and emotion). There was a significant difference on this component between the low- and high-SES Brazilians, so only the high-SES Brazilians are more advanced than Norwegian children. In addition, both the low- and high-SES Brazilian children performed better than Italian children on the component Mixed (a person may experience multiple or even contradictory emotional responses to a situation, object or person). As discussed in the previous section regarding SES differences, the Brazilian children showed good understanding of mixed emotions (32%) in conjunction with their age. When compared with the original study of British children aged 3 to 11 years (Pons et al., 2004), the overall mean for the whole group (N = 100) was .39, and only 20% of the seven-year-olds attained a score on this component. Is there something in emotion socialization in Brazil that influences children to understand this

component, which is expected to be far too complicated for the majority of children aged 3 to 5 years? Because Brazilian studies that focus on emotion socialization are rare, this remains an open question for future research.

Overall, the results indicate that it is difficult to compare children's EU between different study populations when the scoring rules of TEC have been applied differently and when there are different sample sizes (18 children from Peru and 882 children from Norway) and age ranges. In the comparison of children from different countries in Study III, the ordered sequence of gradually lower scores for more difficult components belonging to the hypothesized later or "more mature" phases were not evident. In fact, Recognition is the only component that stands out as easier to develop than all the others (except for the low-SES Brazilian children). There have been a few studies that have analyzed the suggested developmental pattern (external, mentalistic and reflective) of Pons et al. (2004). For example, Albanese et al. (2006) showed age-related increases in all nine components in 4- to 10-year-old Italian children, but these did not conform to the model established by Pons et al. (2004). They found that the development of the Desire component (emotional reactions that depend on desires) belonged to the earlier external period for Italian children and in the later mentalistic period for British children, whereas the Reminder component (emotional reactions depend on memories) showed the inverse pattern. This may indicate that there may be cultural differences regarding the developmental pattern of EU. Another explanation could be that the Italian study (N = 367) included a larger number of subjects than the original British sample (N = 100), making it a more representative sample to generalize from.

## 4.7 Strengths and limitations

A major strength of the studies reported in papers I and II is the large and representative community sample using multiple informants (e.g. parent, child and teacher) and multiple

assessment methods (e.g. semi-structured interviews, questionnaires and observation measures). Furthermore, the research in Studies I and II is the first to assess all nine components of children's EU in a Norwegian sample, and Study II is the largest longitudinal study of children's EU ever conducted. In Study III, Brazilian preschoolers' EU across two SES groups was compared for the first time.

Yet, there are also obvious limitations. Although our operationalization of parental mentalization follows a well-established tradition from both the belief literature (Hirsjärvi & Perälä-Littunen, 2001; Miller, 1986, 1988) and the mentalization literature (Ha, Sharp, & Goodyer, 2011; Sharp et al., 2006), this specific measure of accuracy of mentalizing the child's EU has not been validated before the two first studies of this thesis. As previously mentioned, Sharp and Fonagy (2008) have distinguished between "off-line" mentalizing instruments (more abstract measures that ask the parent about the child's emotions and cognitions, not assessing the child's actual emotional and cognitive competences) and "on-line" mentalizing measurements (observing parent-child interaction and coding mentalization talk). The procedure of measuring mentalization in the present study was somewhere in between. The parents' estimation was compared to their own child's actual responding (similar to "on-line" measurements); however, parents were interviewed and not observed (similar to "off-line" instruments). The mentalization measure used in the present thesis could have been strengthened if we had validated our measure of the accuracy of parental mentalization with, for example, the mind-mindedness measure developed by Meins et al. (2001), which involves observing parents' ability to mentalize when interacting with their child.

In addition, our results may have been altered if parental accuracy of mentalization and emotional availability were measured at T1, and not at T2. It could have strengthened the design if we had also had these two measures at T2 in addition to T1. Furthermore, we did not assess the attachment status of the child or the parent's ability to talk about the nature, causes

and different consequences of different emotions. Also, the parents estimating their child's EU in Studies I and II was mainly mothers. Previous studies have found that mother and father may have different emotion socialization strategies (e.g. Aznar & Tenenbaum, 2015; Denham & Kochanoff, 2002; LaBounty, Wellman, Olson, Lagattuta, & Liu, 2008). This calls attention to the need to study fathers and, thereby, comparatively evaluate both maternal and paternal effects – as well as their interacting influence.

Also, since we wanted to examine many components of the EU development, we chose to use the TEC. This is the only instrument available that measure all nine components of EU with the same procedure at age 4 and 6. But there are some weaknesses with the TEC. The TEC includes several items on components Recognition, External, Desire and Morality whereas only one item was applied for the components Belief, Reminder, Regulation, Hiding and Mixed. This may have had an impact on the children's ability to get a score on the more complicated components because if they failed one item they did not attain a score on this component.

In the Brazilian sample, we collected socio-demographic data only from the high-SES parents. However, this information was not included in paper III in this thesis. The original plan was to assess all parents on several SES measures (education, level of income and a question on how well their wages covered their expenses); however, this was not possible with low-SES parents because they often needed someone with them to read and explain the questionnaires. In addition, we compared TEC scores from different countries, but did not control for possible differences in the way SES was measured in the various countries. However, as shown in table 2 (page 55) , it appears as though the Brazilian high-SES sample and the Norwegian sample were very similar regarding SES level, while the Italian parents seemed to have a lower educational level. In Brazil poorer children attend public preschools

and more economically advanced children attend private preschools. Even though this is common knowledge in Brazil, we failed to find documentation of this.

Finally, in Study III we did not have any information about e.g. parenting style, child IQ or verbal skills or other relevant causal predictors, and the statistics were therefore not advanced with e.g. a regression analysis. We did assess all the Brazilian children with the SDQ, but since the questionnaires were filled out by different informants (parents filled them out for the high-SES group, while teachers did so for the low-SES group), this was not included in the analysis in Study III.

## 4.8 Conclusion and suggestions for future research

> Children's emotional development is both universal even as it is always unique to each child, for the interweaving of genetic heritage and the social and physical environment occurs dynamically over time. *A bio-ecological* approach to emotional development appears to be the most comprehensive framework for investigating emotional competence (Saarni, 2009).

What is most beneficial for EU development: 1) a parent who knows well the child's level of EU, 2) the child's strong social competence or 3) being part of a society with resources? Perhaps we will never be able decipher the lines in the landscape, because children's EU development is part of a socio-ecological process. The present thesis has shown that for preschool children both intrapersonal factors, such as child verbal skills, and interpersonal factors, such as child social competence and parental accuracy of mentalization, contribute to the development of EU. In addition, for Brazilian children, SES status may have contributed to large differences in their EU. Cultural differences in children's EU should be further studied. A recent meta-analysis of 19 studies or experiments from seven different countries showed that EU intervention programs may be effective for improving children's understanding of emotion (Sprung, Münch, Harris, Ebesutani, & Hofmann, 2015); however, there is still a discussion about what to include in intervention programs. Therefore, we need

longitudinal studies of children's EU from different cultures and SES backgrounds, studying the whole age range from e.g. 3 to 11 years with the same instruments, measuring all components of EU in addition to both intra- and interpersonal measures of possible causal factors.

# 5 REFERENCES


Albanese, O., De Stasio, S., Di Chiacchio, C., Fiorilli, C., & Pons, F. (2010). Emotion Comprehension: The Impact of Nonverbal Intelligence. *Journal of Genetic Psychology, 171*(2), 101-115. doi: 10.1080/00221320903548084

Albanese, O., Gavazzi, I. G., Molina, P., Antoniotti, C., Arati, L., Farina, E., & Pons, F. (2006). Children´s emotion understanding: Preliminary data from the Italian validation project of Test of Emotion Comprehension (TEC). In F. Pons, M. F. Daniel, L. Lafortune, P. A. Doudin & O. Albanese (Eds.), *Toward emotional comptetences* (pp. 39-53). Aalborg: Aalborg University Press.

Antshel, K. M., & Remer, R. (2003). Social skills training in children with attention deficit hyperactivity disorder: A randomized-controlled clinical trial. *Journal of Clinical Child and Adolescent Psychology, 32*, 153-165.

Avis, J., & Harris, P. L. (1991). Belief-Desire Reasoning among Baka Children: Evidence for a Universal Conception of Mind. *Child Development, 62*(3), 460. doi: 10.1111/1467-8624.ep9109090173

Aznar, A., & Tenenbaum, H. R. (2013). Spanish parents' emotion talk and their children's understanding of emotion. *Frontiers in Psychology, 4*, 1-11. doi: 10.3389/fpsyg.2013.00670

Aznar, A., & Tenenbaum, H. R. (2015). Gender and age differences in parent–child emotion talk. *British Journal of Developmental Psychology, 33*(1), 148-155. doi: 10.1111/bjdp.12069

Banerjee, R., Watling, D., & Caputi, M. (2011). Peer Relations and the Understanding of Faux Pas: Longitudinal Evidence for Bidirectional Associations. *Child Development, 82*(6), 1887-1905. doi: 10.1111/j.1467-8624.2011.01669.x

Baron-Cohen, S. (2001). Theory of mind in normal development and autism. *Prisme, 34*, 174-183.

Bartsch, K., & Wellman, H. M. (1995). *Children talk about the mind.* (Vol. 33). New York: Oxford University Press.

Bennett, D. S., Bendersky, M., & Lewis, M. (2005). Antecedents of emotion knowledge: Predictors of individual differences in young children. *Cognition & Emotion, 19*(3), 375-396. doi: 10.1080/02699930441000201

Biringen, Z., Robinson, J. L., & Emde, R. N. (1998). *The Emotional Availability scale (3rd ed.)*. Colorado State University, Department of Human Development and Family Studies. Fort Collins, CO.

Bornstein, M. H., Putnick, D. L., Suwalsky, J. T. D., Venuti, P., de Falco, S., de Galperín, C. Z., . . . Tichovolsky, M. H. (2012). Emotional Relationships in Mothers and Infants: Culture-Common and Community-Specific Characteristics of Dyads From Rural and Metropolitan Settings in Argentina, Italy, and the United States. *Journal of Cross-Cultural Psychology, 43*(2), 171-197. doi: 10.1177/0022022110388563

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371-399. doi: 10.1146/annurev.psych.53.100901.135233

Bradmetz, J., & Schneider, R. (1999). Is Little Red Riding Hood afraid of her grandmother? Cognitive vs. emotional response to a false belief. *British Journal of Developmental Psychology, 17*(4), 501-514. doi: 10.1348/026151099165438

Braun, M., & Müller, W. (1997). Measurement of education in comparative research. *Comparative Social Research, 16*, 163-201.

Bretherton, I., McNew, S., & Beeghly-Smith, M. (1981). Early person knowledge as expressed in gestural and verbal communication: When do infants acquire a "theory of mind"? In M. E. Lamb & L. R. Sherrod (Eds.), *Infants social cognition*. Hillsdale, NY: Erlbaum.

Bridges, K. (1932). Emotional development in early infancy. *Child Development, 3*, 324-341.

Brown, J. R., & Dunn, J. (1996). Continuities in emotion understanding from three to six years. *Child Development, 67*(3), 789-802. doi: 10.1111/j.1467-8624.1996.tb01764.x

Campos, J. J., Campos, R. S., & Barrett, K. C. (1989). Emergent Themes in the Study of Emotional Development and Emotional Regulation. *Developmental Psychology, 25*(3), 394-402. doi: 10.1037/0012-1649.25.3.394

Chamorro-Premuzic, T., Arteche, A., Furnham, A., & Trickot, N. (2009). Assessing pupils' intelligence through self, parental, and teacher estimates. *Educational Psychology, 29*(1), 83-97. doi: 10.1080/01443410802520662

Cohen, J. (1998). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, N. J: Laurence Erlbaum Associates.

Cohen, J., Onunaka, N., Clothier, S., & Poppe, J. (2005). Helping Young Children Succeed: Strategies to Promote Early Childhood Social and Emotional Development

Cutting, A. L., & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences and interrelations. *Child Development, 70*(4), 853-865. doi: 10.1111/1467-8624.00061

de Rosnay, M., & Harris, P. L. (2002). Individual differences in children's understanding of emotion: The roles of attachment and language. *Attachment and Human Development, 4*(1), 39-54. doi: 10.1080/14616730210123139

de Rosnay, M., Pons, F., Harris, P. L., & Morrell, J. M. B. (2004). A lag between understanding false belief and emotion attribution in young children: Relationships with linguistic ability and mothers' mental-state language. *British Journal of Developmental Psychology, 22*, 197-218. doi: 10.1348/026151004323044573

Delgadohachey, M., & Miller, S. A. (1993). Mothers' accuracy in predicting their children's IQs - its relationship to antecedent variables, mothers' academic-achievement demands, and children's achievement. *Journal of Experimental Education, 62*(1), 43-59. doi: 10.1080/00220973.1993.9943830

Denham, S. A. (1986). Social Cognition, Pro-Social Behavior, and Emotion in Preschoolers - Contextual Validation. *Child Development, 57*(1), 194-201. doi: 10.2307/1130651

Denham, S. A. (1998). *Emotional Development in Young Children*. New York: The Guilford Press.

Denham, S. A. (2006). Social-emotional competence as support for school readiness: What is it and how do we assess it? *Early Education and Development, 17*(1), 57-89. doi: 10.1207/s15566935eed1701_4

Denham, S. A., Bassett, H. H., Way, E., Mincic, M., Zinsser, K., & Graling, K. (2012). Preschoolers' emotion knowledge: Self-regulatory foundations, and predictions of early school success. *Cognition & Emotion, 26*(4), 667-679. doi: 10.1080/02699931.2011.602049

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development, 74*(1), 238-256. doi: 10.1111/1467-8624.00533

Denham, S. A., & Grout, L. (1993). Socialization of Emotion - Pathway to Preschoolers Emotional and Social Competence. *Journal of Nonverbal Behavior, 17*(3), 205-227. doi: 10.1007/BF00986120

Denham, S. A., & Kochanoff, A. (2002). Parental Contributions to Preschoolers' Understanding of Emotion *Marriage & Family Review, 34*(3 & 4), 311-343. doi: 10.1300/J002v34n03_06

Denham, S. A., McKinley, M., Couchoud, E. A., & Holt, R. (1990). Emotional and behavioral predictors of preschool peer ratings. *Child Development, 61*(4), 1145-1152. doi: 10.1111/j.1467-8624.1990.tb02848.x

Denham, S. A., Mitchell-Copeland, J., Strandberg, K., Auerbach, S., & Blair, K. (1997). Parental contributions to preschoolers' emotional competence: Direct and indirect effects. *Motivation and Emotion, 21*(1), 65-86. doi: 10.1023/A:1024426431247

Denham, S. A., Zoller, D., & Couchoud, E. A. (1994). Socialization of Preschoolers Emotion Understanding. *Developmental Psychology, 30*(6), 928-936. doi: 10.1037//0012-1649.30.6.928

Dennis, T. A., & Kelemen, D. A. (2009). Preschool children's views on emotion regulation: Functional associations and implications for social-emotional adjustment. *International Journal of Behavioral Development, 33*(3), 243-252. doi: 10.1177/0165025408098024

Dias, M. G., Vikan, A., & Gravas, S. (2000). Tentativa de criancas em lidar com as emocoes de raiva e tristeza. *Estudos de Psicologia, 5*, 49-70.

Dunn, J. (1988). *The beginnings of social understanding*. Oxford, UK: Blackwell.

Dunn, J., Bretherton, I., & Munn, P. (1987). Conversations About Feeling States between Mothers and Their Young-Children. *Developmental Psychology, 23*(1), 132-139. doi: 10.1037/0012-1649.23.1.132

Dunn, J., & Brown, J. (1994). Affect Expression in the Family, Childrens Understanding of Emotions, and Their Interactions with Others. *Merrill-Palmer Quarterly-Journal of Developmental Psychology, 40*(1), 120-137.

Dunn, J., Brown, J., & Beardsall, L. (1991). Family Talk About Feeling States and Childrens Later Understanding of Others Emotions. *Developmental Psychology, 27*(3), 448-455. doi: 10.1037//0012-1649.27.3.448

Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young Childrens Understanding of Other Peoples Feelings and Beliefs - Individual-Differences and Their Antecedents. *Child Development, 62*(6), 1352-1366. doi: 10.1111/j.1467-8624.1991.tb01610.x

Dunn, J., & Cutting, A. L. (1999). Understanding Others, and Individual Differences in Friendship Interactions in Young Children. *Social Development, 8*(2), 201-219. doi: 10.1111/1467-9507.00091

Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test* (3rd ed.). Circle Pines, MN: American Guidance Service.

Dunsmore, J. C., & Halberstadt, A. G. (1997). How does family emotional expressiveness affect children's schemas? In K. C. Barrett (Ed.), *The communication of emotion: Current research from diverse perspectives* (pp. 45-68). San Francisco: Jossey-Bass.

Dunsmore, J. C., Her, P., Halberstadt, A. G., & Perez-Rivera, M. B. (2009). Parents' Beliefs about Emotions and Children's Recognition of Parents' Emotions. *Journal of Nonverbal Behavior, 33*(2), 121-140. doi: 10.1007/s10919-008-0066-6

Dunsmore, J. C., & Karn, M. A. (2001). Mothers' Beliefs about Feelings and Children's Emotional Understanding *Early Education & Development, 12*(1), 117-138. doi: 10.1207/s15566935eed1201_7

Dunsmore, J. C., & Karn, M. A. (2004). The influence of Peer Relationships and Maternal Socialization on Kindergartners' Developing Emotion Knowledge. *Early Education & Development, 15*(1), 39-56. doi: 10.1207/s15566935eed1501_3

Easterbrooks, M. A., & Biringen, Z. (2000). Guest editors' introduction to the special issue: Mapping the terrain of emotional availability and attachment *Attachment and Human Development, 2*, 123-129.

Easterbrooks, M. A., & Biringen, Z. (2005). The Emotional Availability Scales: Methodological refinements of the construct and clinical implications related to gender and at-risk interactions. *Infant Mental Health Journal, 26*, 291-294. doi: 10.1002/imhj.20053

Easterbrooks, M. A., & Biringen, Z. (2009). Introduction to the Special Issue: Emotional Availability Across Contexts. *Parenting, 9*(3-4), 179-182. doi: 10.1080/15295190902844266

Egger, H. L., & Angold, A. (2004). The Preschool Age Psychiatric Assessment (PAPA): a structured parent interview for diagnosing psychiatric disorders in preschool children. In R. DelCarmen-Wiggins & A. Carter (Eds.), *Handbook of Infant, Toddler, and Preschool Mental Assessment* (pp. 223-243). New York: Oxford University Press.

Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry, 9*(4), 241-273. doi: 10.1207/s15327965pli0904_1

Endrerud, M. S., & Vikan, A. (2007). Five to seven year old children's strategies for regulating anger, sadness, and fear. *Nordic Psycholgy, 59*, 127-134.

Eyberg, S. M., McDiarmid, N. M., Duke, M., & Boggs, S. R. (2005). Manual for the Dyadic Parent-Child Interaction Coding System (3rd ed.).

Farrant, B. M., Maybery, M. T., & Fletcher, J. (2013). Maternal Attachment Status, Mother-Child Emotion Talk, Emotion Understanding, and Child Conduct Problems. *Child Development Research, 2013*, 1-9. doi: 10.1155/2013/680428

Felleman, E. S., Carlson, C. R., Barden, R. C., Rosenberg, L., & Masters, J. C. (1983). Children's and adults' recognition of spontaneous and posed emotional expressions in young children. *Developmental Psychology, 19*(3), 405-413. doi: 10.1037/0012-1649.19.3.405

Flavell, J. H. (1999). COGNITIVE DEVELOPMENT: Children's Knowledge About the Mind. *Annual Review of Psychology, 50*(1), 21-45. doi: 10.1146/annurev.psych.50.1.21

Fleiss, J. L. (1981). *Statistical methods for rates and proportions* (2nd ed.). New York: John Wiley.
Fonagy, P., Gergely, G., Jurist, E., & Target, M. (2002). *Affect Regulation, Mentalization, and the Development of the Self*. New York: Other Press.
Fonagy, P., Redfern, S., & Charman, T. (1997). The relationship between belief-desire reasoning and a projective measure of attachment security (SAT). *British Journal of Developmental Psychology, 15*, 51-61. doi: 10.1111/j.2044-835X.1997.tb00724.x
Fonagy, P., & Target, M. (1996). Playing with reality: I. Theory of mind and the normal development of psychic reality. *International Journal of Psycho-Analysis, 77*, 217-233.
Fonagy, P., & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology, 9*(4), 679-700.
Fonagy, P., & Target, M. (2006). The mentalization-focused approach to self pathology. *Journal of Personality Disorders, 20*(6), 544-576. doi: 10.1521/pedi.2006.20.6.544
Frankel, F., & Feinberg, D. (2002). Social Problems Associated with ADHD vs. ODD in Children Referred for Friendship Problems. *Child Psychiatry and Human Development, 33*(2), 125-146. doi: 10.1023/A:1020730224907
Frey, J. R., Elliott, S. N., & Gresham, F. M. (2011). Preschoolers' Social Skills: Advances in Assessment for Intervention Using Social Behavior Ratings. *School Mental Health, 3*(4), 179-190. doi: 10.1007/s12310-011-9060-y
Friedlmeier, W., Corapci, F., & Cole, P. M. (2011). Emotion socialization in cross-cultural perspective. *Social and Personality Psychology Compass, 5*(7), 410-427. doi: 10.1111/j.1751-9004.2011.00362.x
Fry, P. S. (1985). Relations between teenagers' age, knowledge, expectations and maternal behaviour. *British Journal of Developmental Psychology, 3*, 47-55. doi: 10.1111/j.2044-835X.1985.tb00954.x
Furnham, A., & Valgeirsson, H. (2007). Parents' estimations of their own intelligence and that of their children: A comparison between English and Icelandic parents. *Scandinavian Journal of Psychology, 48*(4), 289-298. doi: 10.1111/j.1467-9450.2007.00587.x
Gadermann, A., Guhn, M., & Zumbo, B. D. (2008). An empirical comparison of Cronbach's alpha with ordinal reliability coefficients alpha and theta. *International Journal of Psychology, 43*(3-4), 55-55.
Gardner, D., Harris, P. L., Ohmoto, M., & Hamazaki, T. (1988). Japanese Children's Understanding of the Distinction Between Real and Apparent Emotion *International Journal of Behavioral Development, 11*(2), 203-218 doi: 10.1177/016502548801100204
Garner, P. W., Jones, D. C., Gaddy, G., & Rennie, K. M. (1997). Low-income mothers' conversations about emotions and their children's emotional competence. *Social Development, 6*(1), 37-52. doi: 10.1111/j.1467-9507.1997.tb00093.x
Garner, P. W., & Waajid, B. (2012). Emotion Knowledge and Self-Regulation as Predictors of Preschoolers' Cognitive Ability, Classroom Behavior, and Social Competence. *Journal of Psychoeducational Assessment, 30*(4), 330-343. doi: 10.1177/0734282912449441
Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry, 38*, 581-586. doi: 10.1111/j.1469-7610.1997.tb01545.x
Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2000). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *The British Journal of Psychiatry, 177*(6), 534-539. doi: 10.1192/bjp.177.6.534
Gottman, J. M., Katz, L. F., & Hooven, C. (1996). Parental meta-emotion philosophy and the emotional life of families: Theoretical models and preliminary data. *Journal of Family Psychology, 10*(3), 243-268. doi: 10.1037//0893-3200.10.3.243
Gottman, J. M., Katz, L. F., & Hooven, C. (1997). *Meta-Emotion: How Families Communicate Emotionally*. Mahwah, NJ Lawrence Erlbaum.
Gresham, F. M., & Elliot, S. N. (1990). *Social skills rating system manual*. Circle Pines, MN: American Guidance Service.
Gresham, F. M., MacMillan, D. L., Bocian, K. M., Ward, S., L, & Forness, S. R. (1998). Comorbidity of Hyperactivity-Impulsivity-Inattention and Conduct Problems: Risk Factors in Social, Affective, and Academic Domains. *Journal of Abnormal Child Psychology, 26*(5), 393-406. doi: 10.1023/A:1021908024028

Gross, D., & Harris, P. L. (1988). False Beliefs About Emotion - Childrens Understanding of Misleading Emotional Displays. *International Journal of Behavioral Development, 11*(4), 475-488. doi: 10.1177/016502548801100406

Ha, C., Sharp, C., & Goodyer, I. (2011). The role of child and parental mentalizing for the development of conduct problems over time. *European Child & Adolescent Psychiatry, 20*(6), 291-300. doi: 10.1007/s00787-011-0174-4

Hadwin, J., & Perner, J. (1991). Pleased and surprised: Children's cognitive theory of emotion. *British Journal of Developmental Psychology, 9*(2), 215-234. doi: 10.1111/j.2044-835X.1991.tb00872.x

Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. *Social Development, 10*(1), 79-119. doi: 10.1111/1467-9507.00150

Hammer, C. S., Farkas, G., & Maczuga, S. (2010). The Language and Literacy Development of Head Start Children: A Study Using the Family and Child Experiences Survey Database. *Language, Speech, and Hearing Services in Schools, 41*(1), 70-83. doi: 10.1044/0161-1461(2009/08-0050)

Harris, P. L. (1983). Children`s Understanding of the Link between Situation and Emotion. *Journal of Experimental Child Psychology, 36*, 490-509. doi: 10.1016/0022-0965(83)90048-6

Harris, P. L. (1989). *Children and Emotion. The Development of Psychological Understanding.* NY: Basil Blackwell.

Harris, P. L. (1999). Individual differences in understanding emotion: the role of attachment status and psychological discourse. *Attachment and Human Development, 1*(3), 307-324. doi: 10.1080/14616739900134171

Harris, P. L. (2000). Understanding emotions. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 281-292). New York: The Guilford Press.

Harris, P. L., de Rosnay, M., & Pons, F. (2005). Language and children's understanding of mental states. *Current Directions in Psychological Science, 14*(2), 69-73. doi: 10.1111/j.0963-7214.2005.00337.x

Harris, P. L., & Lipian, M. S. (1989). Understanding emotion and experiencing emotion. In C. Saarni & P. L. Harris (Eds.), *Children's understanding of emotion.* (pp. 50-77). New York: Cambridge university press.

Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore: Paul H. Brookes Publishing.

Harter, S., & Buddin, B. J. (1987). Children's Understanding of the Simultaneity of Two Emotions: A Five-Stage Developmental Acquisition Sequence. *Developmental Psychology, 23*(3), 388-399. doi: 10.1037/0012-1649.23.3.388

Harter, S., & Whitesell, N. (1989). Developmental changes in children's emotion concepts. In C. Saarni & P. L. Harris (Eds.), *Children's understanding of emotions* (pp. 81-116). New York: Cambridge University Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? . *Behavioral and Brain Sciences, 33*(2-3), 61-83. doi: 10.1017/S0140525X0999152X

Hirsjärvi, S., & Perälä-Littunen, S. (2001). Parental beliefs and their role in child-rearing. *European journal of psychology of education, 16*(1), 87-116.

Hofstede, G. (1991). *Cultures and organizations: Software of the Mind*. London: MacCraw-Hill.

Huang, K.-Y., Caughy, M. O. B., Genevro, J. L., & Miller, T. L. (2005). Maternal knowledge of child development and quality of parenting among White, African-American and Hispanic mothers. *Journal of Applied Developmental Psychology, 26*(2), 149-170. doi: 10.1016/j.appdev.2004.12.001

Hubbard, J. A., & Coie, J. D. (1994). Emotional Correlates of Social Competence in Children's Peer Relationships. *Merrill-Palmer Quarterly, 40*(1), 1-20.

Hughes, C., & Dunn, J. (1998). Understanding mind and emotion: Longitudinal associations with mental-state talk between young friends. *Developmental Psychology, 34*(5), 1026-1037. doi: 10.1037/0012-1649.34.5.1026

Hughes, C., Dunn, J., & White, A. (1998). Trick or treat?: Uneven understanding of mind and emotion and executive dysfunction in "hard-to-manage" preschoolers. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 39*(7), 981-994.

Hughes, C., & Leekam, S. (2004). What are the Links Between Theory of Mind and Social Relations? Review, Reflections and New Directions for Studies of Typical and Atypical Development. *Social Development, 13*(4), 590-619. doi: 10.1111/j.1467-9507.2004.00285.x

Hunt, J. M., & Paraskevopoulos, J. (1980). Children's psychological development as a function of the inaccuracy of their mothers' knowledge of their abilities. *Journal of Genetic Psychology, 136*( 2), 285-298. doi: 10.1080/00221325.1980.10534123

I.L.O. (1990). *International Classifications of Occupations: ISCO 88*. Geneva: International Labour Office.

Izard, C. (1971). *The face of emotion*. New York: Appleton-Century Crofts.

Izard, C. E., Huebner, R. R., Risser, D., Mcginnes, G. C., & Dougherty, L. M. (1980). Young Infants Ability to Produce Discrete Emotion Expressions. *Developmental Psychology, 16*(2), 132-140.

Jones, D. C., Abbey, B. B., & Cumberland, A. (1988). The development of display rule knowledge: linkages with family expressiveness and social competence. *Child Development, 69*(4), 1209-1222. doi: 10.2307/1132370

Joshi, M. S., & MacLean, M. (1994). Indian and English Children's Understanding of the Distinction between Real and Apparent Emotion. *Child Development, 65*(5), 1372-1384. doi: 10.1111/j.1467-8624.1994.tb00822.x

Kestenbaum, R., & Gelman, S. A. (1995). Preschool Childrens Identification and Understanding of Mixed Emotions. *Cognitive Development, 10*(3), 443-458. doi: 10.1016/0885-2014(95)90006-3

Klasen, H., Woerner, W., Wolke, D., Meyer, R., Overmeyer, S., Kaschnitz, W., . . . Goodman, R. (2000). Comparing the German Versions of the Strengths and Difficulties Questionnaire (SDQ-Deu) and the Child Behavior Checklist. *European Child & Adolescent Psychiatry, 9*(4), 271-276. doi: 10.1007/s007870070030

Korat, O. (2009). How accurate can mothers and teachers be regarding children's emergent literacy development? A comparison between mothers with high and low education *Early Child Development and Care, 179*(1), 27-41. doi: 10.1080/03004430600879232

Kramer, L. (2014). Learning Emotional Understanding and Emotion Regulation Through Sibling Interaction. *Early Education and Development, 25*(2), 160-184. doi: 10.1080/10409289.2014.838824

LaBounty, J., Wellman, H. M., Olson, S., Lagattuta, K., & Liu, D. (2008). Mothers' and Fathers' Use of Internal State Talk with their Young Children. Social Development, 17(4), 757-775. doi: DOI 10.1111/j.1467-9507.2007.00450.x

Lagattuta, K. H., & Wellman, H. M. (2001). Thinking about the past: Early knowledge about links between prior experience, thinking, and emotion. *Child Development, 72*(1), 82-102. doi: 10.1111/1467-8624.00267

Lagattuta, K. H., Wellman, H. M., & Flavell, J. H. (1997). Preschoolers' understanding of the link between thinking and feeling: Cognitive cuing and emotional change. *Child Development, 68*(6), 1081-1104. doi: 10.1111/j.1467-8624.1997.tb01986.x

Lake, N., Lane, S., & Harris, P. L. (1995). The Expectation of Guilt and Resistance to Temptation. *Early Development & Parenting, 4*(2), 63-73. doi: 10.1002/edp.2430040203

Langeveld, H., Gundersen, K., & Svartdal, F. (2012). Social Competence as a Mediating Factor in Reduction of Behavioral Problems. *Scandinavian Journal of Educational Research, 56*(4), 381-399. doi: 10.1080/00313831.2011.594614

Larsen, J. T., To, Y. M., & Fireman, G. (2007). Children's understanding and experience of mixed emotions. *Psychological Science, 18*(2), 186-191. doi: 10.1111/j.1467-9280.2007.01870.x

Lock, A. (1980). *The guided reinvention of language*. London: Academic Press.

Lyon, M. A., Albertus, C., Birkinbine, J., & Naibi, J. (1996). A validity study of the social skills rating system-teacher version with disabled and nondisabled preschool children. *Perceptual and Motor Skills, 83*(1), 307-316. doi: 10.2466/pms.1996.83.1.307

Malmberg, M., Rydell, A. M., & Smedje, H. (2003). Validity of the Swedish version of the Strengths and Difficulties Questionnaire (SDQ-Swe). *Nordic Journal of Psychiatry, 57*(5), 357-363. doi: 10.1080/08039480310002697

Matsumoto, D., & Kishimoto, H. (1983). Developmental characteristics in judgments of emotion from nonverbal vocal cues. *International Journal of Intercultural Relations, 7*, 415-424. doi: 10.1016/0147-1767(83)90047-0
Meins, E. (2013). Sensitive attunement to infants' internal states: operationalizing the construct of mind-mindedness. *Attachment & Human Development, 15*(5-6), 524-544. doi: 10.1080/14616734.2013.830388
Meins, E., Fernyhough, C., Arnott, B., Leekam, S. R., & de Rosnay, M. (2013). Mind-Mindedness and Theory of Mind: Mediating Roles of Language and Perspectival Symbolic Play. *Child Development, 84*(5), 1777-1790. doi: 10.1111/cdev.12061
Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry, 42*(5), 637-648. doi: 10.1017/S0021963001007302
Meins, E., Fernyhough, C., Wainwright, R., Clark-Carter, D., Das Gupta, M., Fradley, E., & Tuckey, M. (2003). Pathways to understanding mind: Construct validity and predictive validity of maternal mind-mindedness. *Child Development, 74*(4), 1194-1211. doi: 10.1111/1467-8624.00601
Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind-mindedness and attachment security as predictors of theory of mind understanding. *Child Development, 73*(6), 1715-1726. doi: 10.1111/1467-8624.00501
Miller, S. A. (1986). Parents' Beliefs About Their Children's Cognitive Abilities. *Developmental Psychology, 22*(2), 276-284. doi: 10.2307/1130311
Miller, S. A. (1988). Parents' Beliefs about Children's Cognitive Development. *Child Development, 59*(2), 259-285. doi: 10.2307/1130311
Miller, S. A. (1995). Parents' Attributions for Their Children's Behavior. *Child Development, 66*(6), 1557-1584. doi: 10.1111/j.1467-8624.1995.tb00952.x
Miller, S. A., Davis, T. L., Wilde, C. A., & Brown, J. (1993). Parents knowledge of their childrens preferences. *International Journal of Behavioral Development, 16*(1), 35-60. doi: 10.1177/016502549301600103
Miller, S. A., Manhal, M., & Mee, L. L. (1991). Parental Beliefs, Parental Accuracy, and Childrens Cognitive Performance - a Search for Causal Relations. *Developmental Psychology, 27*(2), 267-276. doi: 10.1037/0012-1649.27.2.267
Mizokawa, A. (2007). Young children's understanding of false sadness. *The Japanese Journal of Developmental Psychology, 18*, 174-184.
Molina, P., & Bulgarelli, D. (2012). The contribution of parents in the evaluation of children's early communication competence. *Today's Children are Tomorrow's Parents*(32), 21-34
Molina, P., Bulgarelli, D., Henning, A., & Aschersleben, G. (2014). Emotion understanding: A cross-cultural comparison between Italian and German preschoolers. *European Journal of Developmental Psychology, 11*(5), 592-607. doi: 10.1080/17405629.2014.890585
Muscara, F., & Crowe, L. (2012). Measuring social skills with questionnaires and rating scales. In V. Anderson & M. H. Beauchamp (Eds.), *Developmental social neuroscience and childhood brain insult: Theory and practice* (pp. 119-137). New York: Guilford Press.
Muthén, L. K., & Muthén, B. O. (1998-2013). *Mplus User´s guide* (7th ed.). Los Angeles: Muthén & Muthén.
Nunner-Winkler, G., & Sodian, B. (1988). Children's understanding of moral emotions. *Child Development, 59*, 1323-1338. doi: 10.2307/1130495
Odom, S. L., McConnell, S. R., & Brown, W. H. (2008). Social competence of young children: Conceptualization, assessment, and influences. In W. H. Brown, S. L. Odom & S. R. McConnell (Eds.), *Social Competence of Young Children: Risk, Disability, and Intervention* (pp. 31-59). Baltimore, MD: Paul H. Brookes Publishing.
Ogden, T. (2003). The Validity of Teacher Ratings of Adolescents' Social Skills. *Scandinavian Journal of Educational Research, 74*(1), 63-76. doi: 10.1080/00313830308605
Oyen, A. S., Landy, S., & Hilburn-Cobb, C. (2000). Maternal attachment and sensitivity in an at- risk sample. *Attachment & Human Development, 2*(2), 203-217. doi: 10.1080/14616730050085563

Pons, F., Doudin, P. A., Harris, P. L., & De Rosnay, M. (2005). Helping children to improve their emotion comprehension. In F. Pons, D. R. Hancock, L. Lafortune & P. A. Doudin (Eds.), *Emotions in learning* (pp. 15-39). Aalborg: Aalborg Universitetsforlag.
Pons, F., & Harris, P. L. (2000). *Test of Emotion Comprehension (TEC)*. Oxford: University of Oxford.
Pons, F., & Harris, P. L. (2005). Longitudinal change and longitudinal stability of individual differences in children's emotion understanding. *Cognition & Emotion, 19*(8), 1158-1174. doi: 10.1080/02699930500282108
Pons, F., Harris, P. L., & de Rosnay, M. (2004). Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization. *European Journal of Developmental Psychology, 1*(2), 127-152. doi: 10.1080/17405620344000022
Pons, F., Lawson, J., Harris, P. L., & de Rosnay, M. (2003). Individual differences in children's emotion understanding: Effects of age and language. *Scandinavian Journal of Psychology, 44*(4), 347-353. doi: 10.1111/1467-9450.00354
Purcell-Gates, V. (1996). Stories, Coupons, and the TV Guide: Relationships between Home Literacy Experiences and Emergent Literacy Knowledge. *Reading Research Quarterly, 31*(4), 406-428.
Raikes, H. A., & Thompson, R. (2008). Conversations about emotion in high-risk dyads. *Attachment & Human Development, 10*(4), 359-377. doi: 10.1080/14616730802461367
Raikes, H. A., & Thompson, R. A. (2006). Family emotional climate, attachment security and young children's emotion knowledge in a high risk sample. *British Journal of Developmental Psychology, 24*(1), 89-104. doi: 10.1348/026151005X70427
Reichenbach, L., & Masters, J. C. (1983). Children's use of expressive and contextual cues in judgments of emotion. *Child Development, 54*(4), 993-1004. doi: 10.2307/1129903
Roazzi , M. (2007 ). *TEC – Versão em Português* Universidade Federal de Pernambuco
Rocha, A. A., Roazzi, A., Silva, A. L., Candeias, A. A., Minervino, C. A., Roazzi, M. M., & Pons, F. (2015). Test of Emotion Comprehension: Exploring the underlying structure through Confirmatory Factor Analysis and Similarity Structure Analysis. In A. Roazzi, B. C. de Souza & W. Bilsky (Eds.), *Facet Theory: Searching for Structure in Complex Social, Cultural and Psychological Phenomena* (pp. 66-84). Recife: Editora UFPE.
Ruffman, T., Slade, L., & Crowe, E. (2002). The relation between children's and mother's mental state language and theory-of-mind understanding. *Child Development, 73*(3), 734-751. doi: 10.1111/1467-8624.00435
Saarni, C. (1990). Emotional Competence - How Emotions and Relations Become Integrated. *Nebraska Symposium on Motivation, 36*, 115-182.
Saarni, C. (2000). Emotional competence: A developmental perspective. In R. Bar-On & J. D. Parker (Eds.), *The handbook of emotional intelligence* (pp. 69-91). San Francisco: Jossey-Bass.
Saarni, C. (2009). *Cultural and Family Influences on the Development of Emotional Competence.* Paper presented at the Seminar with Saarni, Trondheim.
Saarni, C. (Ed.). (1999). *The Development of Emotional Competence*. NY: The Guildford Press.
Saarni, C., & Harris, P. L. (Eds.). (1989). *Children's understanding of emotion*. Cambridge: Cambridge University Press.
Sagi, A., Koren-Karie, N., Gini, M., Ziv, Y., & Joels, T. (2002). Shedding Further Light on the Effects of Various Types and Quality of Early Child Care on Infant-Mother Attachment Relationship: The Haifa Study of Early Child Care. *Child Development, 73*(4), 1166-1186. doi: 10.2307/3696278
Sénéchal, M., & LeFevre, J. A. (2002). Parental Involvement in the Development of Children's Reading Skill: A Five-Year Longitudinal Study. *Child Development, 73*(2), 445-460. doi: 10.1111/1467-8624.00417
Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychopathology. *Social Development, 17*(3), 737-754. doi: 10.1111/j.1467-9507.2007.00457.x
Sharp, C., Fonagy, P., & Goodyer, I. M. (2006). Imagining your child's mind: Psychosocial adjustment and mothers' ability to predict their children's attributional response styles. *British Journal of Developmental Psychology, 24*, 197-214. doi: 10.1348/026151005X82569

Shavers, V. L. (2007). Measurement of socioeconomic status in health disparities research. *Journal of the National Medical Association, 99*(9), 1013-1023.
Sheridan, S. M., Dee, C. C., Morgan, J. C., McCormick, M. E., & Walker, D. (1996). A multimethod intervention for social skills deficits in children with ADHD and their parents. *School Psychology Review, 25*, 57-76.
Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment & Human Development, 7*(3), 269-281. doi: 10.1080/14616730500245906
Slade, A., Aber, J. L., Bresgi, I., Berger, B., & Kaplan, M. (2004). *The Parent Development Interview, revised*. The City University of New York.
Slaughter, V., Imuta, K., Peterson, C. C., & Henry, J. D. (2015). Meta-Analysis of Theory of Mind and Peer Popularity in the Preschool and Early School Years. *Child Development, 86*, 1159–1174. doi: 10.1111/cdev.12372
Smedje, H., Broman, J. E., Hetta, J., & von Knorring, A. L. (1999). Psychometric properties of a Swedish version of the "Strengths and Difficulties Questionnaire". *European Child and Adolescent Psychiatry, 8*, 63-70.
Smiley, P., & Huttenlocher, J. (1989). Young children's acquisition of emotion concepts. In C. Saarni & P. L. Harris (Eds.), *Children's understanding of emotion* (pp. 27-49). Cambridge: Cambridge University Press.
Southam-Gerow, M. A., & Kendall, P. C. (2002). Emotion regulation and understanding - Implications for child psychopathology and therapy. *Clinical Psychology Review, 22*(2), 189-222. doi: 10.1016/S0272-7358(01)00087-3
Sprung, M., Münch, H. M., Harris, P. L., Ebesutani, C., & Hofmann, S. G. (2015). Children's emotion understanding: A meta-analysis of training studies. *Developmental Review, 37*, 41-65. doi: 10.1016/j.dr.2015.05.001
Sroufe, L. A. (1996). *Emotional development: The organization of emotional life in the early years*. New York: Cambridge University Press.
Steele, H., Steele, M., Croft, C., & Fonagy, P. (1999). Infant-mother attachment at one year predicts children's understanding of mixed emotions at six years. *Social Development, 8*(2), 161-178. doi: 10.1111/1467-9507.00089
Stevens, J. H. (1984). Child development knowledge and parenting skills. *Family Relations, 33*, 237-244. doi: 10.2307/583789
Sun, W., Chou, C., Stacy, A. W., Ma, H., Unger, J., & Gallaher, P. (2007). SAS and SPSS macros to calculate standardized Cronbach's alpha using the upper bound of the phi coefficient for dichotomous items. *Behavior Research Methods, 39*(1), 71-81.
Sveen, T. H., Berg-Nielsen, T. S., Lydersen, S., & Wichstrøm, L. (2013). Detecting Psychiatric Disorders in Preschoolers: Screening With the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry, 52*(7), 728-736. doi: 10.1016/j.jaac.2013.04.010
Swanson, K., Beckwith, L., & Howard, J. (2000). Intrusive caregiving and quality of attachment in prenatally drug-exposed toddlers and their primary caregiver. *Attachment and Human Development, 2*, 130-148. doi: 10.1080/14616730050085527
Taumoepeau, M., & Ruffman, T. (2008). Stepping Stones to Others' Minds: Maternal Talk Relates to Child Mental State Language and Emotion Understanding at 15, 24, and 33 Months. *Child Development, 79*(2), 284-302. doi: 10.1111/j.1467-8624.2007.01126.x
Tenenbaum, H. R., Visscher, P., Pons, F., & Harris, P. L. (2004). Emotional understanding in Quechua children from an agro-pastoralist village. *International Journal of Behavioral Development, 28*(5), 471-478. doi: 10.1080/01650250444000225
Trentacosta, C. J., & Fine, S. E. (2010). Emotion Knowledge, Social Competence, and Behavior Problems in Childhood and Adolescence: A Meta-Analytic Review. *Social Development, 19*(1), 1-29. doi: 10.1111/j.1467-9507.2009.00543.x
Triandis, H. C. (1995). *Individualism & collectivism*. Boulder, CO, US: Westview Press.
Van der Oord, S., Van der Meulen, E. M., Prins, P. J. M., Oosterlaan, J., Buitelaar, J. K., & Emmelkamp, P. M. G. (2005). A psychometric evaluation of the social skills rating system in children with attention deficit hyperactivity disorder. *Behaviour Research and Therapy, 43*(6), 733-746. doi: 10.1016/j.brat.2004.06.004

Vikan, A. (2014). *Innføring om emosjoner*. Trondheim: Akademika forlag.
Vikan, A., & Dias, M. G. (1996). Estrategias para o controle das emocoes: Um estudo transcultural entre criancas. *Arquivos Brasileiros de Psicologia, 48*, 8095.
Vikan, A., Kårstad, S. B., & Dias, M. (2013). Young Brazilian and Norwegian Children's Concepts of Strategies and Goals for Emotion Regulation *Journal of Early Childhood Research, 11*(1), 63-77. doi: 10.1177/1476718X12456981
Vinden, P. G. (1999). Children's Understanding of Mind and Emotion: A Multi-culture Study. *Cognition & Emotion, 13*(1), 19-48. doi: 10.1080/026999399379357
Vygotskij, L. S. (1978). *Mind in society: the development of higher psychological processes*. Cambridge, Mass: Harvard University Press.
Wang, Q. (2008). Emotion knowledge and autobiographical memory across the preschool years: A cross-cultural longitudinal investigation. *Cognition, 108*(1), 117-135. doi: 10.1016/j.cognition.2008.02.002
Waschbusch, D. A., Daleiden, E., & Drabman, R. S. (2000). Are parents accurate reporters of their child's cognitive abilities? *Journal of Psychopathology and Behavioral Assessment, 22*(1), 61-77. doi: 10.1023/A:1007576515188
Washington, J. A., & Craig, H. K. (1999). Performances of at-risk, African American preschoolers on the Peabody Picture Vocabulary Test-III. *Language, Speech & Hearing Services in Schools, 30*(1), 75. doi: 10.1044/0161-1461.3001.75
Wellman, H. M., & Banerjee, M. (1991). Mind and Emotion - Childrens Understanding of the Emotional Consequences of Beliefs and Desires. *British Journal of Developmental Psychology, 9*, 191-214. doi: 10.1111/j.2044-835X.1991.tb00871.x
Wichstrøm, L., Berg-Nielsen, T. S., Angold, A., Egger, H. L., Solheim, E., & Sveen, T. H. (2012). Prevalence of psychiatric disorders in preschoolers. *Journal of Child Psychology and Psychiatry, 53*(6), 695-705. doi: 10.1111/j.1469-7610.2011.02514.x
Williams, K. T., & Wang, J. J. (1997). *Technical reference to the Peabody Picture Vocabulary Test - Third Edition (PPVT-III)*. Circle Pines: American Guideline Service.
Yuill, N. (1984). Young children's co-ordination of motive and outcome in judgments of satisfaction and morality. *British Journal of Developmental Psychology, 2*, 73-81. doi: 10.1111/j.2044-835X.1984.tb00536.x
Zumbo, B. D., Gadermann, A. M., & Zeisser, C. (2007). Ordinal versions of coefficients alpha and theta for Likert rating scales. *Journal of Modern Applied Statistics, 6*, 21-29.

# 6 PAPERS I-III

# Paper I

Kårstad, S. B., Kvello, Ø., Wichstrøm, L., & Berg-Nielsen, T. S. (2014). What do parents know about their children's comprehension of emotions? Accuracy of parental estimates in a community sample of preschoolers. *Child: Care, Health and Development, 40*(3), 346 353. doi: 10.1111/cch.12071

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# What do parents know about their children's comprehension of emotions? Accuracy of parental estimates in a community sample of pre-schoolers

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## Abstract

*Background* Parents' ability to correctly perceive their child's skills has implications for how the child develops. In some studies, parents have shown to overestimate their child's abilities in areas such as IQ, memory and language. Emotion Comprehension (EC) is a skill central to children's emotion regulation, initially learned from their parents. In this cross-sectional study we first tested children's EC and then asked parents to estimate the child's performance. Thus, a measure of accuracy between child performance and parents' estimates was obtained. Subsequently, we obtained information on child and parent factors that might predict parents' accuracy in estimating their child's EC.

*Methods* Child EC and parental accuracy of estimation was tested by studying a community sample of 882 4-year-olds who completed the Test of Emotion Comprehension (TEC). The parents were instructed to guess their children's responses on the TEC. Predictors of parental accuracy of estimation were child actual performance on the TEC, child language comprehension, observed parent–child interaction, the education level of the parent, and child mental health.

*Results* Ninety-one per cent of the parents overestimated their children's EC. On average, parents estimated that their 4-year-old children would display the level of EC corresponding to a 7-year-old. Accuracy of parental estimation was predicted by child high performance on the TEC, child advanced language comprehension, and more optimal parent–child interaction.

*Conclusion* Parents' ability to estimate the level of their child's EC was characterized by a substantial overestimation. The more competent the child, and the more sensitive and structuring the parent was interacting with the child, the more accurate the parent was in the estimation of their child's EC.

**Keywords**
beliefs, emotion comprehension, emotion socialization, parental accuracy

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## Parental beliefs about children's emotions

The importance of parental beliefs of child abilities and their implications for child development have for long been recognized (Murphey 1992; Sigel *et al.* 1992; Hirsjärvi & Perälä-Littunen 2001). This research is broadly spoken divided into beliefs about developmental processes and children's specific abilities. As regards the latter, some studies ask parents about abilities of children in general and others ask parents about their own child's abilities in for example IQ, language and mathematics. Parental emotion socialization has acknowledged the particular importance of parental beliefs regarding children's *emotions* and the way in which these beliefs influence parenting behaviour (Halberstadt *et al.* 2008). Previous studies

have examined parental beliefs about children's emotions in general terms, such as beliefs about ways to guide a child who is experiencing various emotions (Dunsmore *et al.* 2009) and children's developmental readiness to understand and talk about emotions (Dunsmore & Karn 2001). However, previous work has not investigated parents' beliefs about their own child's emotion comprehension. According to Pons and colleagues (2006), Emotion Comprehension (EC) involves one's understanding of the nature, causes and consequences of emotions and the control and regulation of emotions in oneself and others. Research on EC has identified at least nine different components divided into three developmental periods (Pons *et al.* 2004), and the present study will investigate if some components are easier for parents to estimate than others. Past research has documented positive relationships between EC and a variety of developmental outcomes in children, such as secure attachment (Raikes & Thompson 2008), social competence (Denham 2006) and language ability (Pons *et al.* 2003). Delayed or limited child EC has also been documented in research with psychopathological samples (Southam-Gerow & Kendall 2002).

Eisenberg and colleagues (1998) stressed the importance of fit between parenting behaviour and the developmental level of the child. Specifically, the way in which parents thinks about their children's emotions is associated with how the parent responds to and discusses emotions. The degree of fit may thus have impact on the child's arousal, emotion expression and emotion regulation (Eisenberg *et al.* 1998).

Whereas several studies suggest that parents are accurate estimators of their children's cognitive and communication skills (Waschbusch *et al.* 2000; Molina & Bulgarelli 2012), other studies reveal that parents' estimates are only slightly more accurate than chance (Miller *et al.* 1993; Sharp *et al.* 2006). Although researchers agree that parents are prone to overestimate children's skills, researchers disagree as to the strength of this tendency (Furnham & Valgeirsson 2007; Chamorro-Premuzic *et al.* 2009).

## Predictors of parents' estimates of child skills

Children's level of maturation and competence has been proposed by Miller (1988) as a predictor of parents' accuracy of estimation, because bright children are easier for parents to evaluate. Subsequent studies have supported the positive correlation between children's performance and parental accuracy (Hirsjärvi & Perälä-Littunen 2001). Miller (1988) also hypothesized that advanced parental cognitive skills may promote accuracy because such parents are likely to have children with similarly advanced cognitive abilities. However, parental accuracy in domains other than children's EC (e.g. child literacy and IQ) does not seem to be predicted by parents' education or socioeconomic status (Delgadohachey & Miller 1993; Korat 2009).

The quality of the parent–child interaction has been suggested as a predictor of accuracy of estimation, because sensitive and structuring parents are more likely to match their teaching efforts to their child's level of cognitive development. This assumption is called 'the match hypothesis' (Hunt & Paraskevopoulos 1980). However, one study that related parental sensitivity to parents' perception of their child's abilities showed no significant association between accuracy and sensitivity (Huang *et al.* 2005).

Sharp and colleagues (2006) found that mothers who poorly estimated their children's mental state also rated their children as having more symptoms of behavioural-emotional problems. Hence, it cannot be excluded that children's mental health problems are associated with parental accuracy, a hypothesis that will be tested in the present research.

In sum, although several predictors of parental accuracy have been launched, none of these have been examined specifically with respect to parental accuracy in estimating their child's EC.

## Research questions

Our first aim was to determine how accurate parents are in estimating the EC of their 4-year-olds. Drawing upon theories and research on parental accuracy in general, the second aim was to examine the extent to which child EC, child language comprehension, parents' educational level, quality of the parent–child interaction, and child mental health could multivariately and concurrently predict parental accuracy in estimating their child's EC.

## Methods

### Participants and recruitment

Letters of invitation and the Strengths and Difficulties Questionnaire (SDQ) (Goodman 1997) were sent to all families living in the city of Trondheim, Norway, having children born in 2003 or 2004. Details of participants and recruitment have been given elsewhere (Wichstrøm *et al.* 2012); a brief outline will therefore only be given here. Parents brought the completed SDQ to the community health check-up appointment scheduled for their 4-year-olds. A nurse informed the parents about the study using procedures and measures approved by the Regional Committee for Medical and Health Research Ethics and then obtained written consent to participate. Figure 1

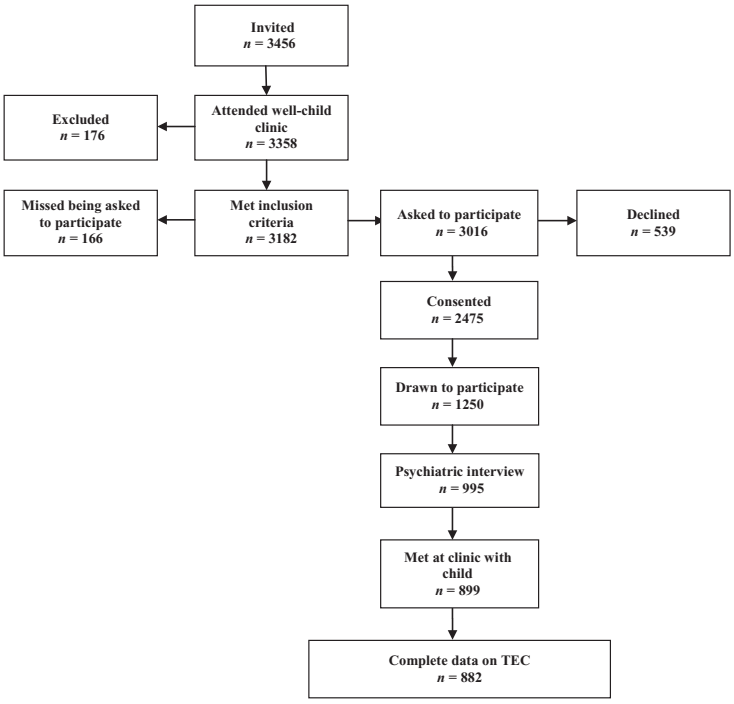


**Figure 1.** A flow chart of the participants and recruitment. TEC, Test of Emotion Comprehension.

shows a flow chart of the participants and recruitment. Children with high scores on the SDQ were oversampled.

The mean age of the children was 53.0 months (range 46.3–63.0, SD = 2.1), with 442 boys and 440 girls. Of the participating parents, 84.8% were mothers and 15.2% were fathers (M = 35.07 years, SD = 5).

Children were tested with Test of Emotion Comprehension (TEC) without their parents present. Later, while children watched a movie using headphones, parents were asked to estimate their children's performance on TEC. Codings of parent–child interaction were obtained from filmed recordings of 30 min interaction involving five tasks: free play, child-lead play, parent-lead play, clean up, and a waiting task.

## Measures

### *Test of emotion comprehension*

The TEC (Pons & Harris 2000) is designed for children aged 3–11 and consists of nine components: Recognition, External cause, Desire, Belief, Reminder, Regulation, Hiding, Mixed, and Morality. A short story accompanied by cartoon scenarios is read aloud to the child. At the end of each story, the child is asked to indicate the emotional response of the story protagonist by pointing to one of four cartoon faces that represent different emotions. Recognition and External cause include five test items (at least four of the five items to get a score). Desire includes four test items (four of four to get score) whereas Belief, Reminder, Regulation, Hiding and Mixed consist of one test item each, and finally Morality includes two items (two of two to get score). The components increase in difficulty and yield a component score (range: 0–9) and an item score (range: 0–21). Previous studies have shown that the nine components on the TEC are scalable [index of consistency $I = 0.68$ (Pons *et al.* 2004) and analysis by the Mokken scale also yielded satisfactory results, H = 0.40, Rho = 0.68 (Albanese *et al.* 2006)]. In the present study, where the increasing difficulty of TEC was not focused, internal consistency was used as a measure of reliability. Because the TEC items are dichotomous $\alpha$, is not strictly applicable and provide the lower bound of reliability ($\alpha = 0.61$) whereas the phi-coefficient is applicable to categorical variables and provide the upper bound of reliability ($\varphi = 0.95$).

*Parental accuracy of estimating children's performance on TEC*

The parents were asked to estimate their children's responses to each question. Reliability of the parental TEC was $\alpha = 0.59$ and $\varphi = 0.98$.

Parental accuracy was measured using an item-by-item correspondence between the parent-estimate and the child's actual response (range: 0–21). Parental accuracy captures the agreement between parents and children *without taking the actual correctness of the child's response into account*. Such a measure of item-by-item accuracy is necessary because a parent could have an estimation score that exactly matches that of the child (e.g. 7/21), but incorrectly estimates all of the child's responses. Because children's responses to TEC were used to create the accuracy score, child TEC and parental accuracy may appear confounded at first glance. However, parental accuracy is a *difference* score on the item level whereas the child's TEC score represents the *level* across items. These two measures are, therefore, logically independent.

*Peabody picture vocabulary test (PPVT-III)*

The Norwegian version of the PPVT-III (Dunn & Dunn 1997) ($\alpha = 0.98$) measures children's receptive language ability. The PPVT-III has demonstrated good validity and reliability (Dunn & Dunn 1997).

*Emotional availability scales, 3rd edn (EA)*

The EA scales (Biringen *et al*. 1998) are used to assess dyadic interactions between parents and children. EA scales include four parental dimensions (sensitivity, structuring, non-intrusiveness, and non-hostility) and a sum of these scores. The total parent variable was used in this study ($\alpha = 0.74$). All raters had the equivalent of a bachelor's degree within a relevant discipline and were trained and certified as reliable scorers. The inter-rater reliability between blinded coders on the total parent scale was intraclass correlation coefficient (ICC) = 0.71.

*Parental education*

Information about parental education was obtained from interviews and measured on an 11-point scale that ranged from 'did not complete junior high school' to 'completed a doctoral degree'.

*Strengths and difficulties questionnaire*

The SDQ (Goodman 1997) is a brief screening questionnaire for children and adolescents aged 4–16 years consisting of five 5-item sub-scales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and pro-social behaviour. The total problem score (range: 0–40) is generated by summing the scores from all of the scales except for the pro-social scale ($\alpha = 0.74$). The SDQ has proven validity (Goodman 1997) and reliability (Smedje *et al*. 1999).

### Statistical analysis

We used Cohen's kappa (Fleiss 1981) to measure the extent of inter-rater agreement between parents and children at the component level. We used component level in the comparison instead of item level because components 1–3 and 9 consist of more items than other components, hence, an item level comparison would amplify the value of the easier components. Cohen's *d* was used to measure differences between parental estimates and child mean scores at the component level (Cohen 1998). Mothers and fathers did not differ in their estimates and were therefore combined in the analyses.

Because we oversampled for mental health problems, all results were weighted back to represent true population estimates, and the Huber–White sandwich estimator was used to provide corrected standard errors. Multivariate predictors of accuracy were examined by General Linear Model (GLM).

## Results

### Accuracy of parental estimates of children's EC

Parental average estimate of children's performance on TEC was M = 6.50 (SD = 1.4) and child average scores were M = 3.35 (SD = 1.3). Seven of the nine components contained items showing large differences between parental estimates and child scores (Table 1).

As can be seen in Table 2 parental accuracy was poor; the kappa was only moderately significant for the components Desire, Belief and Regulation.

Exploratory analyses showed that the variable of parental accuracy was normally distributed with a minimum of 1 and a maximum of 19 (range 0–21). The average total level of accuracy was 12 out of 21 items (M = 12.09, SD = 2.4). The correlation between children's actual TEC score and their parent-estimated TEC score was modest, $r = 0.14$, $P < 0.001$.

| Components | Parents | | Children | | Accuracy of parents' estimate d-values |
|---|---|---|---|---|---|
| | M (SD) | *n* | M (SD) | *n* | |
| Recognition | 0.95 (0.18) | 882 | 0.89 (0.27) | 882 | 0.27 |
| External cause | 0.93 (0.21) | 882 | 0.49 (0.41) | 879 | 1.42 |
| Desire | 0.71 (0.38) | 879 | 0.38 (0.41) | 877 | 0.84 |
| Belief | 0.63 (0.41) | 875 | 0.20 (0.35) | 868 | 1.13 |
| Reminder | 0.82 (0.32) | 872 | 0.35 (0.41) | 872 | 1.29 |
| Regulation | 0.48 (0.41) | 874 | 0.30 (0.38) | 869 | 0.46 |
| Hiding | 0.83 (0.33) | 874 | 0.43 (0.41) | 866 | 1.08 |
| Mixed | 0.70 (0.38) | 874 | 0.25 (0.38) | 864 | 3.63 |
| Morality | 0.48 (0.41) | 876 | 0.09 (0.24) | 871 | 2.32 |

**Table 1.** Parent and child mean component scores on Test of Emotion Comprehension, standard deviation, number of cases and Cohen's d

| Components | Correct (*n*) | Incorrect (*n*) | Total *n* | Cohen k | *P* |
|---|---|---|---|---|---|
| Recognition | 755 | 134 | 882 | 0.03 | 0.269 |
| External cause | 440 | 439 | 879 | 0.03 | 0.065 |
| Desire | 425 | 450 | 875 | 0.07 | 0.007** |
| Belief | 395 | 469 | 864 | 0.05 | 0.023* |
| Reminder | 362 | 455 | 866 | 0.02 | 0.248 |
| Regulation | 482 | 384 | 866 | 0.09 | 0.005** |
| Hiding | 399 | 464 | 863 | 0.02 | 0.340 |
| Mixed | 357 | 504 | 861 | 0.02 | 0.290 |
| Morality | 457 | 413 | 870 | 0.01 | 0.695 |

**Table 2.** Parental accuracy in estimating child answers on nine TEC component questions – number of correct estimations, incorrect estimations and Cohen's kappa

*$P < 0.05$; **$P < 0.01$.

**Table 3.** Parent and child mean total scores, standard deviation and number of cases on the *independent variables*

| | M | SD | *n* |
|---|---|---|---|
| Child emotion comprehension (TECc) | 3.35 | 1.31 | 882 |
| Child language comprehension (PPVT) | 92.76 | 18.1 | 881 |
| Parents' emotional availability (EA) | 106.48 | 8.4 | 617 |
| Parents education level | 7.13 | 1.7 | 864 |
| Child mental health (SDQ) | 5.62 | 1.01 | 881 |

TECc, Test of Emotion Comprehension child; PPVT, Peabody Picture Vocabulary Test; EA, Parents' emotional availability; SDQ, Strengths and Difficulties Questionnaire.

Subtracting the children's total TEC score from that of the parents showed that 91% of the parents overestimated their children's TEC by 1 point or more, 4.9% of the parents matched their children's score, and 4.1% of the parents underestimated their children's score. Of the 91% of parents who overestimated, 64.2% did so by 3 points or more, and 12% did so by 6 points or more.

### Prediction of parental accuracy

Table 3 provides descriptive information concerning the predictor variables.

Parental accuracy and child EC were highly correlated ($r = 0.68$, $P < 0.01$) whereas parental accuracy and child language comprehension were moderately correlated ($r = 0.38$, $P < 0.01$).

Collectively the alleged predictors explained 51% of the variance in parental accuracy. The main proportion of this variance was because of children's actual EC. Although child language comprehension and parental emotional availability emerged as significant predictors, they explained considerably less of the variance. Parental education level and child mental health did not contribute (Table 4).

## Discussion

The accuracy of parents' estimates of children's EC was investigated in a large and representative community sample of 4-year-olds. The results showed that 91% of parents overestimated their children's EC. Parental accuracy was strongly associated with children's performance on TEC and to a lesser extent with child language comprehension, and sensitive and structuring parenting.

### The accuracy of parental estimates of children's EC

The children in our study demonstrated a level of EC that is consistent with prior studies of TEC (Pons *et al.* 2004; Farina *et al.* 2007) and the broader literature on EC of 4-year-olds (Saarni & Harris 1989; Harris 2000). Thus, it is all the more

**Table 4.** Parental accuracy in estimating child's emotion comprehension predicted by child and parent factors in a Multivariate General Linear Model

| Independent variables | d.f. | B estimate | S.E. | Wald F | *P* |
|---|---|---|---|---|---|
| Child performance on EC (TECc) | 601 | 1.20 | 0.061 | 385.93 | >0.001 |
| Language comprehension (PPVT) | 601 | 0.03 | 0.004 | 45.51 | >0.001 |
| Parent's education level | 601 | 0.02 | 0.038 | 0.30 | 0.585 |
| Parent–child interaction (EA) | 601 | 0.02 | 0.009 | 3.91 | 0.048 |
| Child mental health (SDQ) | 601 | 0.02 | 0.018 | 0.830 | 0.363 |
| Model fit | $r^2 = 0.51$ ($P < 0.001$) | | | | |

TECc, Test of Emotion Comprehension child; PPVT, Peabody Picture Vocabulary Test; EA, Parents' emotional availability; SDQ, Strengths and Difficulties Questionnaire.

striking to find, on average, parents predicting their 4-year-old to show EC equivalent to that of a 7-year-old. Although there are considerable individual differences across children in EC (Pons & Harris 2005), individual differences alone cannot explain why so many parents overestimated their children's EC.

The correlation that we found between the parents' total TEC estimates and their children's total scores on the TEC is lower than what is commonly reported in the literature on parental accuracy. Parents' accuracy in estimating their children's responses to the components Desire, Belief and Regulation were comparatively high. There is no ready explanation for this, and it should be further acknowledged that the agreement, albeit significant, was very low and that whether these kappas significantly differed from the other kappas was not tested. All over, the parents demonstrated a general unawareness about their child's EC and the main 'error' was overestimation. It seems to be more challenging for parents to know covert states, i.e. what their children know about emotions, than it is to perceive easily observable behaviour (Salbach-Andrae *et al.* 2009). Furthermore, as the present study involves children with similar cultural backgrounds, we do not know if this unawareness could be culture specific.

### Parental overestimation

Parents' overestimation may be most apparent in parents of pre-school children because parents of school-aged children tend to receive more feedback about their children's skills. Miller and colleagues (1993) found parents of fifth-graders to be more accurate than parents of second-graders in predicting their children's preferences (e.g. favourite dinner and school subject).

One might argue that parents' overestimation simply reflects the way in which parents naturally socialize their children's emotional development by prematurely interpreting and naming emotions, thereby guiding their children to grow in emotional competence. A major point at issue here relates to whether the discrepancy between parental estimates and their children's level of development indicates non-optimal parenting or if it's a manifestation of parents' attempts to promote EC in their children.

Sharp and colleagues (2006) interpreted parental accuracy in estimating their children's abilities as an operationalization of parents' ability to mentalize. The overestimation observed in the present study may arise from the difficulties parents experience in terms of developing mentalistic insight into their children's EC. However, parents' overestimation may also reflect an attempt to present a good impression of their children's abilities. Nevertheless, although this interpretation is more 'benign' than the first, the desire of parents to present a good impression of their child does not preclude the possibility of a non-optimal parent–child interaction.

### Child and parent predictors

Parental accuracy was largely predicted by child EC and moderately predicted by child verbal intelligence. General cognitive ability may foster the development of EC. Thus, there may be indirect effects of cognitive ability on parental accuracy mediated by children's EC that could not be detected in a cross-sectional design. Parents of children with many correct answers on TEC will have more 'hits' on their child's ability because of the overestimation. This may represent a 'ceiling effect' regardless of any parental mentalization capacity.

Parents' with more optimal parenting behaviour gave more accurate estimates of their children's EC. Although the association was modest, it points in the direction of the 'match hypothesis'. Nonetheless, the present design precludes any causal interpretation; hence high scoring children may just as well have parents that are more competent in their accuracy estimation *and* their parenting. There was no association between parental education and the accuracy of parental estimates of children's EC. Similar results have also been found in previous research on other child domains (Delgadohachey & Miller 1993; Korat 2009). Also, children with more emotional and behavioural problems did not have parents who rated them less accurately.

The emotional states of children without mental health problems may be easier for parents to infer than those of children with such problems. However, this study suggests that parents' knowledge about child emotions is equally difficult to infer, irrespective of child emotional and behavioural problems.

### Limitations

The present study has several limitations. The cross-sectional design precludes any causal implications. Furthermore, our sample contains two birth cohorts of roughly the same age. We do not know whether our findings extend to older children or a clinical sample.

### Conclusion

The results show that parents substantially overestimate the EC of their children. Hence, parental accounts of EC in their young children must be interpreted with caution. Knowing that parents overestimate is relevant for mental health nurses, pre-school teachers, caregivers and paediatricians working with families with young children. Parents are often the ones who refer their children to educational or clinical settings. If parents overestimate their children's EC, they may fail to see their children's need for help and guidance in everyday situations. Future longitudinal studies will enable a deeper understanding of the consequences when the parents' expectations are greater than the actual social–emotional competence of their child.

### Key messages

- The majority of parents of pre-schoolers overestimate their children's emotion comprehension.
- The principal finding of earlier research and the present study is that: the higher children's level of abilities, the more accurate their parents are in their judgement of their children's abilities.
- There is a need to evaluate the consequences of parents' overestimation on children's social–emotional development.

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## References

Albanese, O., Gavazzi, I. G., Molina, P., Antoniotti, C., Arati, L., Farina, E. & Pons, F. (2006) Children's emotion understanding: preliminary data from the Italian validation project of Test of Emotion Comprehension (TEC). In: *Toward Emotional Comptetences* (eds F. Pons, M. F. Daniel, L. Lafortune, P. A. Doudin & O. Albanese), pp. 39–53. Aalborg University Press, Aalborg, Danmark.

Biringen, Z., Robinson, J. L. & Emde, R. N. (1998) *The Emotional Availability Scale*, 3rd edn. Department of Human Development and Family Studies, Colorado State University, Fort Collins, CO, USA.

Chamorro-Premuzic, T., Arteche, A., Furnham, A. & Trickot, N. (2009) Assessing pupils' intelligence through self, parental, and teacher estimates. *Educational Psychology*, **29**, 83–97.

Cohen, J. (1998) *Statistical Power Analysis for the Behavioral Sciences*, 2nd edn. Laurence Erlbaum Associates, Hillsdale, NJ, USA.

Delgadohachey, M. & Miller, S. A. (1993) Mothers accuracy in predicting their childrens IQs – its relationship to antecedent variables, mothers academic-achievement demands, and childrens achievement. *Journal of Experimental Education*, **62**, 43–59.

Denham, S. A. (2006) Social-emotional competence as support for school readiness: what is it and how do we assess it? *Early Education and Development*, **17**, 57–89.

Dunn, L. M. & Dunn, L. M. (1997) *Peabody Picture Vocabulary Test*, 3rd edn. American Guidance Service, Circle Pines, MN, USA.

Dunsmore, J. C. & Karn, M. A. (2001) Mothers' beliefs about feelings and children's emotional understanding. *Early Education & Development*, **12**, 117–138.

Dunsmore, J. C., Her, P., Halberstadt, A. G. & Perez-Rivera, M. B. (2009) Parents' beliefs about emotions and children's recognition of parents' emotions. *Journal of Nonverbal Behavior*, **33**, 121–140.

Eisenberg, N., Cumberland, A. & Spinrad, T. L. (1998) Parental socialization of emotion. *Psychological Inquiry*, **9**, 241–273.

Farina, E., Albanese, O. & Pons, F. (2007) Making inferences and individual differences in emotion understanding. *Psychology of Language and Communication*, **11**, 3–19.

Fleiss, J. L. (1981) *Statistical Methods for Rates and Proportions*, 2nd edn. John Wiley, New York, NY, USA.

Furnham, A. & Valgeirsson, H. (2007) Parents' estimations of their own intelligence and that of their children: a comparison between English and Icelandic parents. *Scandinavian Journal of Psychology*, **48**, 289–298.

Goodman, R. (1997) The strengths and difficulties questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, **38**, 581–586.

Halberstadt, A. G., Thompson, J. A., Payer, A. E. & Dunsmore, J. C. (2008) Parents' emotion-related beliefs and behaviours in relation to children's coping with the 11 September 2001 terrorist attacks. *Infant and Child Development*, **17**, 557–580.

Harris, P. (2000) Understanding emotions. In: *Handbook of Emotions*, 2nd edn (eds M. Lewis & J. Haviland-Jones). pp. 281–292. The Guilford Press, New York, NY, USA.

Hirsjärvi, S. & Perälä-Littunen, S. (2001) Parental beliefs and their role in child-rearing. *European Journal of Psychology of Education*, **16**, 87–116.

Huang, K.-Y., Caughy, M. O. B., Genevro, J. L. & Miller, T. L. (2005) Maternal knowledge of child development and quality of parenting among White, African-American and Hispanic mothers. *Journal of Applied Developmental Psychology*, **26**, 149–170.

Hunt, J. M. & Paraskevopoulos, J. (1980) Children's psychological development as a function of the inaccuracy of their mothers' knowledge of their abilities. *Journal of Genetic Psychology*, **136**, 285–298.

Korat, O. (2009) How accurate can mothers and teachers be regarding children's emergent literacy development? A comparison between mothers with high and low education. *Early Child Development and Care*, **179**, 27–41.

Miller, S. A. (1988) Parents' beliefs about children's cognitive development. *Child Development*, **59**, 259–285.

Miller, S. A., Davis, T. L., Wilde, C. A. & Brown, J. (1993) Parents knowledge of their childrens preferences. *International Journal of Behavioral Development*, **16**, 35–60.

Molina, P. & Bulgarelli, D. (2012) The contribution of parents in the evaluation of children's early communication competence. Today's Children are Tomorrow's Parents TCTP (32), 21–34.

Murphey, D. A. (1992) Constructing the child – relations between parents beliefs and child outcomes. *Developmental Review*, **12**, 199–232.

Pons, F. & Harris, P. (2000) *Test of Emotion Comprehension – TEC*. Oxford University Press, Oxford, UK.

Pons, F. & Harris, P. L. (2005) Longitudinal change and longitudinal stability of individual differences in children's emotion understanding. *Cognition & Emotion*, **19**, 1158–1174.

Pons, F., Lawson, J., Harris, P. L. & de Rosnay, M. (2003) Individual differences in children's emotion understanding: effects of age and language. *Scandinavian Journal of Psychology*, **44**, 347–353.

Pons, F., Harris, P. L. & de Rosnay, M. (2004) Emotion comprehension between 3 and 11 years: developmental periods and hierarchical organization. *European Journal of Developmental Psychology*, **1**, 127–152.

Pons, F., de Rosnay, M., Doudin, P. A., Harris, P. & Cuisinier, F. (2006) Emotion understanding as a reflective emotional competence: between experience and symbols. In: *Toward Emotional Comptetences* (eds F. Pons, M. F. Daniel, L. Lafortune, P. A. Doudin & O. Albanese), pp. 19–38. Aalborg University Press, Aalborg, Danmark.

Raikes, H. A. & Thompson, R. (2008) Conversations about emotion in high-risk dyads. *Attachment & Human Development*, **10**, 359–377.

Saarni, C. & Harris, P. (eds) (1989) *Children's Understanding of Emotion*. Cambridge University Press, Cambridge, MA, USA.

Salbach-Andrae, H., Klinkowski, N., Lenz, K. & Lehmkuhl, U. (2009) Agreement between youth and parent-reported psychopathology in a referred sample. *European Child & Adolescent Psychiatry*, **18**, 136–143.

Sharp, C., Fonagy, P. & Goodyer, I. M. (2006) Imagining your child's mind: psychosocial adjustment and mothers' ability to predict their children's attributional response styles. *British Journal of Developmental Psychology*, **24**, 197–214.

Sigel, I. E., McGillicuddy-DeLisi, A. V. & Goodnow, J. J. (eds) (1992) *Parental Belief Systems: The Psychological Consequences for Children*. Erlbaum, Hillsdale, NJ, USA.

Smedje, H., Broman, J. E., Hetta, J. & von Knorring, A. L. (1999) Psychometric properties of a Swedish version of the 'Strengths and Difficulties Questionnaire'. *European Child and Adolescent Psychiatry*, **8**, 63–70.

Southam-Gerow, M. A. & Kendall, P. C. (2002) Emotion regulation and understanding – Implications for child psychopathology and therapy. *Clinical Psychology Review*, **22**, 189–222.

Waschbusch, D. A., Daleiden, E. & Drabman, R. S. (2000) Are parents accurate reporters of their child's cognitive abilities? *Journal of Psychopathology and Behavioral Assessment*, **22**, 61–77.

Wichstrøm, L. S., Berg-Nielsen, T. S., Angold, A., Egger, H. L., Solheim, E. & Sveen, T. H. (2012) Prevalence of psychiatric disorders in preschoolers. *Journal of Child Psychology and Psychiatry*, **53**, 695–705.

# Paper II

Kårstad, S. B., Wichstrøm, L., Reinfjell, T., Belsky, J., & Berg-Nielsen, T. S. (2015). What enhances the development of emotion understanding in young children? A longitudinal study of interpersonal predictors. *British Journal of Developmental Psychology Child, 33(3),* 340-354. doi: 10.1111/bjdp.12095

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# What enhances the development of emotion understanding in young children? A longitudinal study of interpersonal predictors

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We studied potential determinants of the development of children's emotion understanding (EU) from age 4 to 6 in a Norwegian community sample ($N$ = 974) using the Test of Emotion Comprehension. Interpersonal predictors included the accuracy of parental mentalization, parental emotional availability, and teacher-reported child social skills. Intrapersonal child factors were child gender and verbal skills. Overall, children's EU increased significantly over time. After adjusting for child gender, age-4 EU, and parental socio-economic status, greater child verbal and social skills and greater parental mentalization each uniquely predicted growth in EU. Results are discussed in terms of theory and research on children's EU and parents' emotion socialization.

Emotion understanding (EU), which refers to one's ability to know the feelings of others and oneself, is essential for competent social functioning and psychological well-being (de Rosnay, Harris, & Pons, 2008). Models describing the development of EU (Halberstadt, Denham, & Dunsmore, 2001; Pons, Harris, & de Rosnay, 2004; Saarni, 1999) highlight several components of EU, from labelling and identifying emotion-eliciting situations to understanding more complex sentiments such as ambivalence and moral emotions. Past research documents links between EU and a variety of positive developmental outcomes, including secure attachment (Fonagy & Target, 1997; Raikes & Thompson, 2008; de Rosnay & Harris, 2002), social competence (Denham, 2006; Dunn & Cutting, 1999), and language skills (Pons, Lawson, Harris, & de Rosnay, 2003). Preschool children who are better at identifying emotions in others also have fewer behaviour problems (Hughes, Dunn, & White, 1998). Delayed development of and limitations in EU are associated, in contrast, with mental disorders (for review, see Southam-Gerow & Kendall, 2002).

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Although children's EU, on average, advances considerably from age 2 years to middle childhood (Hughes & Dunn, 1998; Nelson *et al.*, 2012; Ontai & Thompson, 2002), substantial individual differences in EU exist among children (Harris, 2000; Pons & Harris, 2005). Why do some children excel in EU at an early age whereas others exhibit more limited development? This is the primary question addressed in this report.

Intervention research makes clear that direct training of preschoolers (Domitrovich, Cortes, & Greenberg, 2007; Gavazzi & Ornaghi, 2011) and school-age children (Ornaghi, Brockmeier, & Grazzani, 2014; Tenenbaum, Alfieri, Brooks, & Dunne, 2008) enhances children's EU. Such specific and targeted EU training is not the primary means by which EU development is facilitated in most children. As noted by Denham (1998), interpersonal and intrapersonal factors are the primary drivers of EU development in the lives of most children, so it is these that are the foci of this enquiry.

### *Interpersonal predictors*

Regarding interpersonal factors, emotion socialization starts in the family in the early preschool years and is later supplemented by preschool teachers and peers. Children's interactions and relationships with other people, including their peers, are thought to be the primary means through which children learn about and practise their EU skills. Therefore, in the present enquiry, we focus on interpersonal factors, specifically parents' mentalizing ability (in 'reading' their child's mind), their non-hostile, sensitive parenting, and children's social skills. We regard the latter as an interpersonal factor because the social skills' measure use herein – the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) – mostly taps children's behaviour directed towards peers. We acknowledge that the targeted interpersonal predictors are not extensive and, most notably, exclude important aspects of emotion socialization, perhaps most especially parents' explicit discussion of emotion with their children (Aznar & Tenenbaum, 2013; Dunn, Brown, & Beardsall, 1991; Farrant, Maybery, & Fletcher, 2013).

#### *Parental emotional availability*

Parents' emotional resources are likely to influence their children's EU and its development. The emotion socialization literature highlights the influence of parents' ability to accept and help children experience both negative and positive emotions on children's emotional development. Having parents who name and value all types of emotions and who create an emotional climate in which a child's emotions are addressed in a sensitive and non-hostile way is hypothesized to help the child learn about his or her own and other people's emotions (e.g., Eisenberg, Cumberland, & Spinrad, 1998). Empirically, the importance of the emotional quality of the parent–child interaction for the development of EU has received some support in cross-sectional research (Denham & Grout, 1993; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997) and longitudinal studies (Denham, Zoller, & Couchoud, 1994). For example, Denham and Kochanoff (2002) reported that children's EU at ages 3 and 4 was predicted by mothers' positive observed emotions, attentiveness to their children's emotions, and willingness to help their children address their emotions. Unfortunately, it is not clear from such work whether the association reflects parent or child effects (or some other source of influence). Thus, we extend previous enquiry using repeated-measurements of EU to test the proposition that greater parental emotional availability measured at age 4 predicts *increased* EU from age 4 to 6.

### *Accuracy of parental mentalization*

Parents' ability to value and understand their children's emotions and thoughts influences the children's socio-emotional development (Sharp & Fonagy, 2008). Concepts such as *mind-mindedness* (Meins *et al.*, 2003), *reflective function* (Fonagy & Target, 1997), *meta-emotion philosophy* (Gottman, Katz, & Hooven, 1996), *insightfulness* (Oppenheim & Koren-Karie, 2013), and the *accuracy of parental mentalization* (Sharp, Fonagy, & Goodyer, 2006) all refer to an individual's ability to value and understand another person's emotions and thoughts. Fonagy and Target (1997) argue that children's mentalization abilities develop within emotionally charged relationships, while contending that the effect of parental mentalization is mediated via parental behaviour (e.g., parental emotion talk, social interactions during play).

Cross-sectional evidence indicates that mothers who describe their 4- to 6-year-old children in more mentalistic terms have children with more advanced EU (de Rosnay, Pons, Harris, & Morrell, 2004). Due to problems inherent in interpreting such cross-sectional associations, here we rely on a longitudinal design that affords testing the prediction that the greater a parent's ability to take his or her child's perspective, the more the child's EU will increase over time. Evidence consistent with this hypothesis would extend findings from a small sample study ($n$ = 33) by Meins, Fernyhough, Russell, and Clark-Carter (1998) showing that greater use of mentalizing language by mothers of 3-year-olds predicted greater child EU 2 years later. Instead of relying on a mentalizing measure based on mothers' verbal description and analysis of videotaped interactions with their children, we developed a measure of the accuracy of parental mentalization, following Sharp *et al.* (2006), that involves a direct comparison of the child's actual performance on a test of EU with the parent's estimate of child performance on a test of EU.

### *Child social skills*

Banerjee, Watling, and Caputi (2011) observed that a specific component of EU, namely false belief understanding, emerges between 3 and 5 years of age, the development of which coincides with a dramatic increase in peer interaction. Indeed, having more friends and being well liked by peers and teachers, capabilities that are influenced by and influence social skills are positively related to EU (Denham, 1986; Denham, McKinley, Couchoud, & Holt, 1990; Denham *et al.*, 2003). Indeed, some contend that advanced EU predicts advanced social skills (Denham *et al.*, 2003; Garner & Estep, 2001). Of course, the reverse process of influence also seems possible, such that more and higher quality peer interactions enable children to practise and further develop their emotional and social skills (Banerjee *et al.*, 2011). Consistent with this claim, Maguire and Dunn (1997) found that children ($N$ = 41) displaying high complexity of social play at 69 months evinced greater understanding of mixed emotions at 7 months later. Similarly, Dunsmore and Karn (2004) measured peer relationships and EU on two occasions across a 6-month period, from age 5.5 to 6 years ($N$ = 45), observing that popular children and children with more stable friendships manifested greater growth in EU than other children. Once again, the modest sample sizes raise questions about the replicability and generalizability of the findings, as does the study's failure to evaluate other interpersonal factors known to be related to EU simultaneously. Nevertheless, consistent with the findings summarized above, we hypothesize that child social skills at 4 years of age will predict increased child EU from 4 to 6 years, even after controlling for other intra- and interpersonal variables.

### *Intrapersonal and demographic factors*

Intrapersonal factors included in this report, along with family demographic factors, will serve as covariates in the multivariate analyses to be reported – so that the unique effects of the interpersonal factors already mentioned can be estimated. The covariates have been selected based on prior work showing them to be related to either EU or the interpersonal predictors of EU considered in this enquiry. They include children's gender (Root & Denham, 2010) and verbal skills (Cutting & Dunn, 1999; Pons *et al.*, 2003; de Rosnay & Harris, 2002; de Rosnay *et al.*, 2004), as well as parental socio-economic status (SES; Cutting & Dunn, 1999; Dunn & Brown, 1994).

### *The present study*

1. The present study is the largest population study to investigate EU development over time. In this study, we included interpersonal predictors while controlling for intrapersonal covariates, and we used the same instrument at both time points. Based on prior research, our initial hypotheses were as follows:
2. Parental emotional availability and the accuracy of parents' mentalization measured when their child was 4 years predict an increase in children's EU measured at age 6. In addition, more mature social skills in children measured at age 4 also predict an increase in children's EU measured at age 6.

## Method

### *Participants and procedure*

A letter of invitation was sent to all parents of two birth cohorts of children in a city in mid-Norway (approximately 200,000 inhabitants). To increase the variability in EU (and other measured constructs) in an age-restricted sample, we oversampled for children with social, emotional, and behavioural problems, using the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) as a screening instrument in sample selection and recruitment. The SDQ is an efficient screening for mental-health problems in preschoolers (Sveen, Berg-Nielsen, Lydersen, & Wichstrøm, 2013), which are known to correlate with EU (Southam-Gerow & Kendall, 2002). Details about the procedure and recruitment have been presented elsewhere (Wichstrøm *et al.*, 2012); thus, only a brief outline is provided here.

The parents brought the completed SDQ to the community health check-up appointment that is routinely scheduled for all Norwegian 4-year-olds. Of the parents who were eligible for the study, 97.2% showed up for their appointments at one of the city's well-child clinics. Parents who were not sufficiently proficient in Norwegian to complete the SDQ screen were excluded from the study. A nurse at the clinic informed the parents about the study using procedures and measures approved by the Regional Committee for Medical and Health Research Ethics and then obtained written consent from the parents to participate in the study. A small percentage of the families (5.2%) were not asked to participate because of an error on the part of the clinic staff.

The SDQ is a 31-item measure that has been demonstrated to have an excellent screening ability for psychiatric symptoms among preschoolers (Sveen *et al.*, 2013). SDQ scores on the symptom scale (20 items) were divided into four strata: 0–4, 5–8, 9–11, and 12–40. With a random number generator, defined proportions of parents in each stratum (.37, .48, .70, and .89, respectively) were drawn for participation in further studies. The

sample was adjusted for stratification in all analyses. The dropout rate after consenting at the well-child clinic did not differ across the four SDQ strata ($\chi^2$ = 5.70, df = 3, NS) or gender ($\chi^2$ = 0.23, df = 1, NS).

Because of child fatigue and missing data from the parents, the analysis sample for this study consisted of 926 parent–child dyads in the first assessment (T1), with 464 boys and 462 girls who completed the TEC. The mean age of the children at T1 was 4.4 years (range 3.85–5.36, *SD* = 0.18). Nearly every caretaker attending the clinic with their child (*M* = 35.1 years, *SD* = 5.0) was the child's biological parent (99.5%), was married or had lived with their partner for more than 6 months (87.6%), and was a woman (84.4%). Both mothers (95.8%) and fathers (94.2%) were of primarily Norwegian ancestry. After the sample was adjusted for stratification, the sample was compared to register information from Statistics Norway on the parents of all 4-year-olds in the mid-Norway city in 2007 and 2008. The sample contained a higher proportion of divorced parents (7.6%) compared with the population as a whole (2.1%), whereas the level of parental education was virtually identical across the sample and population. Consequently, the sample is considered a representative community sample.

In total, 756 children reassessed after 2.4 years (T2), when each child had started first grade (*M* = 6.7 years, range = 6.0–7.7, *SD* = 0.16), had usable TEC scores. Among these children, 48 did not provide usable TEC scores when they were 4 years old. Thus, 974 children had usable TEC measures at either 4 or 6 years and formed the analysis sample. None of the study variables proved significant in predicting attrition.

Children were tested at the clinic without their parents present, and parents granted consent to mail a questionnaire to the childcare provider who knew the child best in the day care centre they were attending. While the child watched a movie in the same room as their parent while wearing headphones, the parent was asked to estimate their children's EU. Parent–child interaction was then videotaped for 30 min across five tasks (Eyberg, McDiarmid, Duke, & Boggs, 2005): Free play (10 min), child-guided play (5), parent-guided play (5), clean-up (max: 5), and child-waiting (i.e., not interacting with the parent) while the parent answered a questionnaire (5).

## Measures

### *Emotion understanding*

Emotion understanding was assessed using a Norwegian translation (by the first author, with proofreading by bilingual scholars) of the TEC (Pons & Harris, 2000) at T1 and T2. The TEC is designed for children aged 3–11 years and is composed of nine components. The nine components are described in Table 1, divided into three developmental periods suggested by Pons *et al.* (2004). The TEC has been widely used in research around the world and has been translated to 18 languages (Albanese *et al.*, 2006; Pons & Harris, 2005; Tenenbaum, Visscher, Pons, & Harris, 2004).

A short story accompanied by cartoon scenarios was read aloud to the child while the 'faces' of the cartoon characters were presented without any feature or expression (i.e., a blank circle). At the story's end, the child was asked to indicate the emotional response of the story's protagonist by pointing to one of the four cartoon faces expressing different emotions presented for this purpose, two displaying negative emotions (sad, scared; sad, angry; or scared, angry) and two non-negative emotions (happy, just alright). Practice questions are administered before test questions to confirm children's comprehension of the procedure. The TEC has separate versions for girls and boys, and administration lasted for approximately 15–20 min.

**Table 1.** Nine components of emotion understanding by age and skills

| Period | Component | Skill |
|---|---|---|
| External period | Recognition (3–4 years old) | Recognize and name the basic emotions |
| | External cause (3–4 years old) | Understand how external causes affect emotions in others |
| | Desire (3–5 years old) | Understand the effect of desires in the emotional reactions of others |
| Mentalistic period | Reminder (3–6 years old) | Understand the effect of past information on emotions |
| | Belief (4–6 years old) | Understand the effect of beliefs (true or false) on the emotional reactions of others |
| | Hiding (4–6 years old) | Understand the differences between the outwardly expressed emotion and the actual, inwardly experienced emotion |
| Reflective period | Regulation (8 years old) | Understand the effectiveness of using cognitive strategies to maintain control of emotions |
| | Morality (±8 years old) | Understand that emotions are linked to morally reprehensible actions and to praiseworthy actions |
| | Mixed emotion (±8 years old) | Understand that a person may experience multiple emotions in response to a single situation |

The components increase in difficulty and yield a sum score (range: 0–9), with a score of 0 or 1 at each component level. Recognition (component 1) and External cause (component 2) are assessed with five test items, and at least four of the five items must be answered to obtain score of 1. Desire (component 3) is assessed with four test items (4/4 must be answered correctly to obtain score of 1), whereas Belief (component 4), Reminder (component 5), Regulation (component 6), Hiding (component 7), and Mixed (component 8) consist of one test item each. Morality (component 9) is assessed with two items, and both must be answered to obtain score of 1. For a more detailed description of the TEC, see Pons *et al.* (2004).

The theta test was used to assess the reliability; it accounts for the categorical ordering of the data (Zumbo, Gadermann, & Zeisser, 2007) and overcomes some limits of Cronbach's alpha (Gadermann, Guhn, & Zumbo, 2008). The theta for the TEC was .82 at T1 and .91 at T2.

### *Interpersonal predictors*

#### *Parental emotional availability*

This predictor was assessed with the EA Scales, 3rd ed. (Biringen, Robinson, & Emde, 1998). Parent and child interactions were videotaped at T1. The EA scales are used to rate four parental dimensions (sensitivity, structuring, non-intrusiveness, and non-hostility) and two child dimensions (responsiveness to and involvement with the parent). All dimensions are assessed in the context of the dyadic interaction, instead of being specific to the behaviour of an individual child or parent; however, we used the sum total of the four parent ratings, as the four parent ratings yielded an internally consistent score in our sample ($\alpha$ = .74). All raters were trained and certified as reliable by Z. Biringen, who developed the EA. The inter-rater reliability between multiple blinded coders on a random 10% sample of the videotapes for the total parent scale was ICC = .71.

*The accuracy of parental mentalization*

This parental accuracy measure regarding children's EU was assessed at T1 using a method described by Sharp *et al.* (2006). Therefore, we first tested the child alone, and the parent was then instructed to provide responses to the TEC *as if they were their child*. The accuracy of parental mentalization reflects the item-by-item correspondence between the parent's estimate and the child's actual response to each question on the TEC (range: 0–21). Because the accuracy of parental mentalization measure captures the agreement between parents and children *without considering the actual correctness of the child's response*, we chose to use all the items instead of the total score (0–9) because the total scores include scoring rules that depend on the correctness of the answer. This approach avoided the possibility of a parent generating an estimation score that exactly matched that of the child (e.g., 3/9) but incorrectly estimating all of the child's individual responses. Because parental accuracy is a *difference* score on the item level whereas the child's TEC score represents the *level* across items, the two measures are conceptually independent.

*Child social skills*

This predictor was assessed by the total score of the 30-item Social Skills Rating System-teacher report (SSRS-T) (Gresham & Elliot, 1990) at T1 ($\alpha$ = .93). The SSRS-T was completed at T1 by the preschool teacher who was best acquainted with the child.

### *Intrapersonal and demographic factors*

*Verbal skills*

The Norwegian version of the Peabody Picture Vocabulary Test (PPVT-III) (L. M. Dunn & Dunn, 1997) was used to measure the children's receptive language ability at T1. The examiner presented a word that described one of four pictures on a page and asked the child to point to or say the number of the picture corresponding to the word. The test consisted of four practice items and 204 test items arranged in order of difficulty ($\alpha$ = .98).

*Parental SES*

In addition to the child's gender, parental SES was included as a covariate. Parental occupational status was used as a proxy for SES. The parent who completed the parent version of the TEC was interviewed about her/his occupation. Parental occupational data were coded according to the International Classifications of Occupations (International Labour Office, 1990), yielding the following categories: Unskilled workers, farmers/fishermen, skilled workers, lower professionals, higher professionals, and leaders. Because parental mentalization and parent–child interactions might covary with each individual's SES, we used the informant parent's SES rather than both parents' SES.

## Results

Descriptive analyses are presented first, followed by the primary prediction analysis of development of EU from 4 to 6 years. Because we oversampled for mental-health problems, analyses were performed with weights inversely proportional to the drawing probability (i.e., the results for children with high scores on the SDQ were weighted down, and the results for children with low scores on the SDQ were weighted up).

Moreover, a robust maximum-likelihood estimator was used, which yields robust standard errors. Participants were included if they had usable scores on EU at T1 or T2 ($n$ = 974). Missing data were handled according to a full information maximum-likelihood procedure using Mplus 7.2 (Muthén & Muthén, 1998–2013). These corrections were performed for all analyses, thereby enabling us to generalize the findings to the larger population from which the study sample was drawn.

### *Descriptive analyses*

Two sets of analyses involving the mean EU and correlations are presented. Table 2 lists the descriptive statistics for all the study variables. At 4 years, the mean EU score was $M_{\text{EU 4 years}} = 3.36$, $SD = 1.54$. This score almost doubled by T2, $M_{\text{EU 6 years}} = 5.92$, $SD = 1.43$. To examine the development of EU over time, a growth modelling approach was used. To accommodate growth with only two measurement points, the error terms of EU were set to zero. Growth was parameterized as yearly change. $M_{\text{growth}}$ was 1.28, $p < .001$. Because such a change could partly result from altered importance of TEC items as the child grows, measurement invariance was evaluated. The factor loadings of the individual TEC components were examined by the model test procedure in Mplus. None of the factor loadings differed at age 4 and 6 years (i.e., all $p$-values > .10). Figure 1 depicts the percentage of children who correctly completed the EU components at T1 and T2. As the figure shows, the distribution was not truncated at either end of the continuum; therefore, the measurement did not suffer from any major floor and ceiling effects. The overall TEC score improved for most children (84.9%) from T1 to T2, whereas the score did not change for 8.8% of children and declined for 6.3% of children.

Table 3 presents the correlations among all the study variables, showing that EU scores at T1 and T2 were modestly positively correlated. Additionally, greater verbal skills and parental mentalization (measured at T1) were related to better EU, with associations larger

**Table 2.** Descriptive statistics of the study variables from T1

| Predictors and covariates | *M* (*SD*) |
|---|---|
| Interpersonal predictors | |
| Accuracy of parental mentalization | 12.11 (2.4) |
| Emotional availability | 105.41 (15.14) |
| Social skills | 57.35 (10.37) |
| Intrapersonal and demographic factors | |
| Verbal skills | 92.54 (23.27) |
| | % |
| Parent's socio-economic status | |
| Unskilled workers | 3.1 |
| Farmers/fishermen | 0.6 |
| Skilled workers | 25.2 |
| Lower professionals | 39.9 |
| Higher professionals | 25.6 |
| Leaders | 5.6 |

*Note*. EU = emotion understanding.

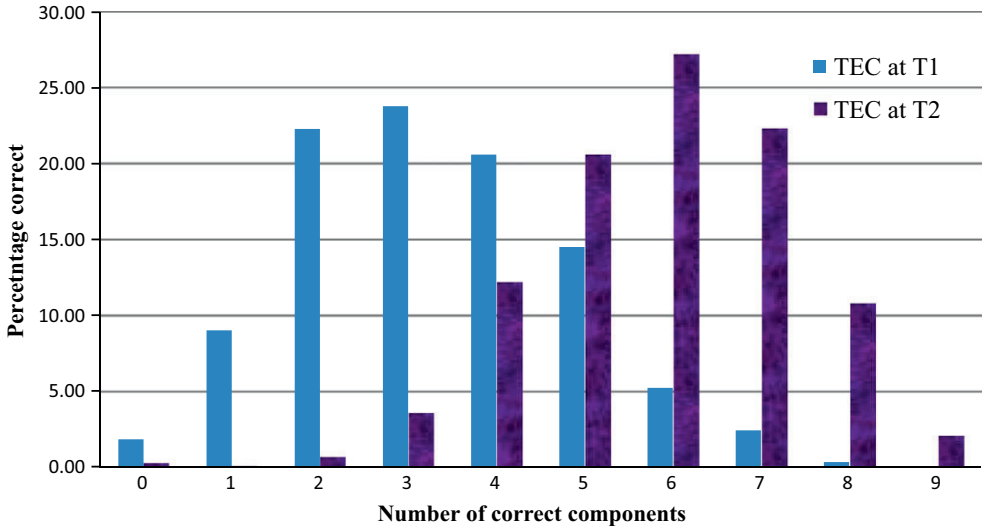


**Figure 1.** Histogram showing number of correct components comparing the child sum scores from TEC at T1 and TEC at T2.

**Table 3.** Correlations between variables

| Parental accuracy of mentalization (1) | Emotional availability (2) | Social skills (3) | Verbal skills (4) | SES (5) | Gender (% girls) (6) | EU (T1) (7) | EU (T2) (8) |
|---|---|---|---|---|---|---|---|
| 1. | .14* | .08* | .52*** | .09* | .07 | .81*** | .20*** |
| 2. | | .15*** | .15*** | .19*** | .03 | .14** | .06 |
| 3. | | | .15*** | .11** | .20*** | .04 | .20*** |
| 4. | | | | .15*** | .00 | .40*** | .18*** |
| 5. | | | | | −.04 | .07 | .10* |
| 6. | | | | | | .01 | .04 |
| 7. | | | | | | | .16*** |
| 8. | | | | | | | |

*Note.* EU = emotion understanding; SES = socio-economic status.
*$p < .05$, **$p < .01$, ***$p < .001$.

at T1 than at T2; greater parental emotional availability was associated with higher EU at T1; and better social skills (measured at T1) were related to better EU at T2.

### *Prediction of growth in EU from T1 to T2*

To test predictors of growth in EU, the growth parameters of growth and intercept (EU at T1) were regressed on parental mentalization and emotional availability, child social and verbal skills as well as gender and parental SES. These predictors were allowed to correlate. To adjust for potential regression towards the mean effects (e.g., some children could obtain high scores simply by chance by pointing to the correct answers), the slope

was regressed on the intercept. Parental mentalization, parental emotional availability, and child social skills were measured as latent variables. Because parental mentalization items were dichotomous (right or wrong), they were treated as categorical variables. However, this approach resulted in a frequency table for the latent class indicator model that was too large for Mplus to handle, so the chi-square could not be computed. Thus, common model fit indices (e.g., $\chi^2$, RMSEA, CFI, and TLI) could not be computed. Analysing the model without parental mentalization could provide an indication of model fit of the full model, and this proved satisfactory: $\chi^2(38) = 111.04$, $p < .001$, RMSEA = .044, CFI = .972, TLI = .954, SRMR = .024.

Results are presented in Table 4. Greater parental accuracy of mentalization (T1) was associated with larger EU intercept at T1. More importantly, greater parental accuracy predicted a larger increase in EU over time (i.e., slope), as did better verbal and social skills. As expected when regression towards the mean is at play and as often found in research applying growth curves, the intercept strongly predicted reduced growth. Efforts to determine whether effects of parental mentalization were moderated by levels of verbal skills, social skills, and parental emotional availability revealed no significant interaction effects.

## Discussion

To extend prior research on children's EU, we investigated interpersonal predictors and intrapersonal covariates of development in EU from 4 to 6 years in a large community sample of Norwegian children. Results showed that more verbally and socially skilled 4-year-olds whose parents demonstrated better mentalization displayed the greatest EU growth. Taken together, our findings and those of other studies indicate that there are substantial individual differences not only in the *level* of EU but also in the *pace* at which EU develops during the latter part of the preschool years. Hence, children who lag in EU in

**Table 4.** Predictors and covariates regressed on the intercept and slope of EU from age 4 to 6

| | Intercept (4 years) | | | | | Slope (change from 4 to 6 years) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *B* | *SE B* | β | 95% CI | *p*-value | *B* | *SE B* | β | 95% CI | *p*-value |
| Intercept | | | | | | −.52 | .04 | −.82 | −0.93 to 0.71 | <.001 |
| Intrapersonal and demographic factors | | | | | | | | | | |
| Verbal skills | .00 | .00 | .05 | −0.01 to 0.12 | .12 | .00 | .00 | .07 | 0.02 to 0.13 | .01 |
| Gender (% girls) | −.10 | .09 | −.03 | −0.09 to 0.03 | .27 | .02 | .06 | .01 | −0.05 to 0.07 | .75 |
| SES | −.01 | .05 | −.01 | −0.07 to 0.05 | .83 | .05 | .03 | .05 | −0.01 to 0.11 | .07 |
| Interpersonal predictors | | | | | | | | | | |
| Parental accuracy of mentalization | .98 | .29 | .76 | 0.68 to 0.85 | <.001 | .13 | .07 | .16 | 0.03 to 0.30 | .02 |
| Emotional availability | .02 | .02 | .03 | −0.05 to 0.11 | .42 | .00 | .01 | .00 | −0.07 to 0.07 | .97 |
| Social skills | −.03 | .02 | −.05 | −0.12 to 0.01 | .12 | .03 | .01 | .10 | 0.04 to 0.17 | <.05 |
| $R^2$ | | | .58 | | <.001 | | | .51 | | <.001 |

*Note*. EU = emotion understanding; SES = socio-economic status; *B* = unstandardized regression coefficient; β = standardized regression coefficient.

the mid-preschool period might show rapid increases during the next few years, whereas others display only modest improvements.

Our findings support Banerjee *et al.*'s (2011) claim that a lack of social skills may impair children's ability to develop EU. Most research on the predictors of social-cognitive development has focused on the first 5 years of life, a period during which parents may be more important socialization agents than peers. In the present study, we followed children across the transition from preschool to school, a time when friends become important socialization agents and children develop the ability to mentalize not only their own emotions but also other's emotional reactions. Our results show that children's social skills are a predictor of growth in EU.

Among the parent-related predictors examined in this study, only parental mentalization (not the more behavioural aspect of parental emotional availability) uniquely predicted an increase in EU from age 4 to 6. Hence, the present data suggest that in fostering children's understanding of emotions, parents' ability to mentalize is more important than parental structuring and sensitivity, at least as measured using the Emotional Availability Scales. If the parent knows the child's level of EU, it may be easier to match emotion language and emotion regulation strategies to the child's developmental needs. The parent can behave in a way that fits the child's zone of proximal development to help the child foster better EU.

Or it may be a measurement effect. Parent–child interaction was rated after seeing 30-min videotaped interaction. Many parents may show socially desirable parental behaviour within that time span, but behave otherwise while not being observed. Whereas the way mentalization was measured, socially desirable responding (a parent indicating that their child understands more than it actually does) does not result in a good score, but reveals the discrepancy between parental belief or wish and child actual performance. Future work should seek to test these interpretations of our findings.

Our results are consistent with prior cross-sectional findings that document positive associations between parental mentalization and children's EU (Kårstad, Kvello, Wichstrøm, & Berg-Nielsen, 2014; Meins *et al.*, 1998; de Rosnay *et al.*, 2004) and longitudinal results pertaining to the child's theory of mind by Meins *et al.* (2002). Our mentalization measure directly compares the parental estimate to the child's actual level of EU, and it is less time-consuming to score and interpret the results than other mentalization measures. Future work should examine the covariation of these different mentalization measures.

At the level of individual differences, the stability of EU was modest, with EU at age 4 predicting 2 years later to roughly the same extent as the other age-4 predictors. Starting at age 4 (i.e., when EU is beginning to emerge), one might suspect that modest continuity of EU might result from a floor effect at age 4 when the TEC tasks are too difficult for most 4-year-olds. However, Figure 1 indicates that most children were successful on some EU components, with children's scores at this time varying considerably. Therefore, in combination with high reliability of the TEC, the present findings indicate that there is only modest stability in EU during this developmental period, at least in the population studied. Whether this is also true in other populations is a question for future research.

Although the present research has several strengths, such as prospective multivariate analyses of data from a large and representative community study and the inclusion of a parental mentalization measure, the results should be interpreted in the light of several limitations. First, although our operationalization of parental mentalization follows a well-established tradition (Ha, Sharp, & Goodyer, 2011; Sharp *et al.*, 2006), this specific measure has not been validated beyond the findings of this study. Furthermore, parental

emotional availability was assessed in a laboratory setting, which might have compromised the ecological validity of the study. Additionally, our reliance mainly on mothers calls attention to the need to study fathers and, thereby, comparatively evaluate both maternal and paternal effects – as well as their interacting influence.

While the effects detected were modest in magnitude, they are nevertheless informative with potential translational implications. Most importantly, it should be clear that EU is still developing by the time children start school. As well, it appears that parents' understanding of their child's EU capabilities contributes to its continued growth. This suggests that efforts to facilitate such understanding may contribute to its development, a goal which could be addressed in many ways, no doubt. For example, preschool teachers could be encouraged to inform parents about their children's EU in addition to the intervention programmes already proven useful in research (Domitrovich *et al.*, 2007; Gavazzi & Ornaghi, 2011). If there is a large discrepancy between parent's knowledge of their child's EU, mentalization-based interventions could be introduced with a special focus on parents' ability to read their children's EU.

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## References

Albanese, O., Gavazzi, I. G., Molina, P., Antoniotti, C., Arati, L., Farina, E., & Pons, F. (2006). Children's emotion understanding: Preliminary data from the Italian validation project of Test of Emotion Comprehension (TEC). In F. Pons, M. F. Daniel, L. Lafortune, P. A. Doudin & O. Albanese (Eds.), *Toward emotional competences* (pp. 39–53). Aalborg, Denmark: Aalborg University Press.

Aznar, A., & Tenenbaum, H. R. (2013). Spanish parents' emotion talk and their children's understanding of emotion. *Frontiers in Psychology*, *4*, 1–11. doi:10.3389/fpsyg.2013.00670

Banerjee, R., Watling, D., & Caputi, M. (2011). Peer relations and the understanding of faux pas: Longitudinal evidence for bidirectional associations. *Child Development*, *82*, 1887–1905. doi:10.1111/j.1467-8624.2011.01669.x

Biringen, Z., Robinson, J. L., & Emde, R. N. (1998). *The emotional availability scale* (3rd ed.). Fort Collins, CO: Department of Human Development and Family Studies, Colorado State University.

Cutting, A. L., & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences and interrelations. *Child Development*, *70*, 853–865. doi:10.1111/1467-8624.00061

de Rosnay, M., & Harris, P. L. (2002). Individual differences in children's understanding of emotion: The roles of attachment and language. *Attachment & Human Development*, *4*(1), 39–54. doi:10.1080/14616730210123139

de Rosnay, M., Harris, P. L., & Pons, F. (2008). Emotional understanding and developmental psychopathology in young children. In C. Sharp, P. Fonagy & I. Goodyer (Eds.), *Social cognition and developmental psychopathology* (pp. 343–385). Oxford, UK: Oxford University Press.

de Rosnay, M., Pons, F., Harris, P. L., & Morrell, J. M. B. (2004). A lag between understanding false belief and emotion attribution in young children: Relationships with linguistic ability and mothers' mental-state language. *British Journal of Developmental Psychology*, *22*, 197–218. doi:10.1348/026151004323044573

Denham, S. A. (1986). Social cognition, pro-social behavior, and emotion in preschoolers: Contextual validation. *Child Development*, *57*(1), 194–201. doi:10.2307/1130651

Denham, S. A. (1998). *Emotional development in young children*. New York, NY: The Guilford Press.

Denham, S. A. (2006). Social-emotional competence as support for school readiness: What is it and how do we assess it? *Early Education and Development*, *17*(1), 57–89. doi:10.1207/s15566935eed1701_4

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development*, *74*(1), 238–256. doi:10.1111/1467-8624.00533

Denham, S. A., & Grout, L. (1993). Socialization of emotion: Pathway to preschoolers' emotional and social competence. *Journal of Nonverbal Behavior*, *17*, 205–227. doi:10.1007/BF00986120

Denham, S. A., & Kochanoff, A. (2002). Parental contributions to preschoolers' understanding of emotion. *Marriage & Family Review*, *34*, 311–343. doi:10.1300/J002v34n03_06

Denham, S. A., McKinley, M., Couchoud, E. A., & Holt, R. (1990). Emotional and behavioral predictors of preschool peer ratings. *Child Development*, *61*, 1145–1152. doi:10.1111/j.1467-8624.1990.tb02848.x

Denham, S. A., Mitchell-Copeland, J., Strandberg, K., Auerbach, S., & Blair, K. (1997). Parental contributions to preschoolers' emotional competence: Direct and indirect effects. *Motivation and Emotion*, *21*(1), 65–86. doi:10.1023/A:1024426431247

Denham, S. A., Zoller, D., & Couchoud, E. A. (1994). Socialization of preschoolers' emotion understanding. *Developmental Psychology*, *30*, 928–936. doi:10.1037/0012-1649.30.6.928

Domitrovich, C. E., Cortes, R. C., & Greenberg, M. T. (2007). Improving young children's social and emotional competence: A randomized trial of the preschool "PATHS" curriculum. *The Journal of Primary Prevention*, *28*, 67–91. doi:10.1007/s10935-007-0081-0

Dunn, J., & Brown, J. (1994). Affect expression in the family, children's understanding of emotions, and their interactions with others. *Merrill-Palmer Quarterly*, *40*(1), 120–137.

Dunn, J., Brown, J., & Beardsall, L. (1991). Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology*, *27*, 448–455. doi:10.1037/0012-1649.27.3.448

Dunn, J., & Cutting, A. L. (1999). Understanding others, and individual differences in friendship interactions in young children. *Social Development*, *8*, 201–219. doi:10.1111/1467-9507.00091

Dunn, L. M., & Dunn, L. M. (1997). *Peabody picture vocabulary test* (3rd ed.). Circle Pines, MN: American Guidance Service.

Dunsmore, J. C., & Karn, M. A. (2004). The influence of peer relationships and maternal socialization on kindergartners' developing emotion knowledge. *Early Education and Development*, *15*(1), 39–56. doi:10.1207/s15566935eed1501_3

Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry*, *9*, 241–273. doi:10.1207/s15327965pli0904_1

Eyberg, S. M., McDiarmid, N. M., Duke, M., & Boggs, S. R. (2005). *Manual for the dyadic parent-child interaction coding system* (3rd ed.). University of Florida.

Farrant, B. M., Maybery, M. T., & Fletcher, J. (2013). Maternal attachment status, mother-child emotion talk, emotion understanding, and child conduct problems. *Child Development Research*, *2013*, 1–9. doi:10.1155/2013/680428

Fonagy, P., & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology*, *9*, 679–700.

Gadermann, A., Guhn, M., & Zumbo, B. D. (2008). An empirical comparison of Cronbach's alpha with ordinal reliability coefficients alpha and theta. *International Journal of Psychology*, *43*, 55.

Garner, P. W., & Estep, K. M. (2001). Emotional competence, emotion socialization, and young children's peer-related social competence. *Early Education and Development*, *12*(1), 29–48. doi:10.1207/s15566935eed1201_3

Gavazzi, I. G., & Ornaghi, V. (2011). Emotional state talk and emotion understanding: A training study with preschool children. *Journal of Child Language*, *38*, 1124–1139. doi:10.1017/s0305000910000772

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, *38*, 581–586. doi:10.1111/j.1469-7610.1997.tb01545.x

Gottman, J. M., Katz, L. F., & Hooven, C. (1996). Parental meta-emotion philosophy and the emotional life of families: Theoretical models and preliminary data. *Journal of Family Psychology*, *10*, 243–268. doi:10.1037/0893-3200.10.3.243

Gresham, F. M., & Elliot, S. N. (1990). *Social skills rating system manual*. Circle Pines, MN: American Guidance Service.

Ha, C., Sharp, C., & Goodyer, I. (2011). The role of child and parental mentalizing for the development of conduct problems over time. *European Child & Adolescent Psychiatry*, *20*, 291–300. doi:10.1007/s00787-011-0174-4

Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. *Social Development*, *10*(1), 79–119. doi:10.1111/1467-9507.00150

Harris, P. (2000). Understanding emotions. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 281–292). New York, NY: The Guilford Press.

Hughes, C., & Dunn, J. (1998). Understanding mind and emotion: Longitudinal associations with mental-state talk between young friends. *Developmental Psychology*, *34*, 1026–1037. doi:10.1037/0012-1649.34.5.1026

Hughes, C., Dunn, J., & White, A. (1998). Trick or treat?: Uneven understanding of mind and emotion and executive dysfunction in "hard-to-manage" preschoolers. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *39*, 981–994.

International Labour Office (1990). *International standard classification of occupations: ISCO-88*. Geneva, Switzerland: Author.

Kårstad, S. B., Kvello, Ø., Wichstrøm, L., & Berg-Nielsen, T. S. (2014). What do parents know about their children's comprehension of emotions? Accuracy of parental estimates in a community sample of preschoolers. *Child: Care, Health and Development*, *40*, 346–353. doi:10.1111/cch.12071

Maguire, M. C., & Dunn, J. (1997). Friendships in early childhood, and social understanding. *International Journal of Behavioral Development*, *21*, 669–686. doi:10.1080/016502597384613

Meins, E., Fernyhough, C., Russell, J., & Clark-Carter, D. (1998). Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development*, *7*(1), 1–24. doi:10.1111/1467-9507.00047

Meins, E., Fernyhough, C., Wainwright, R., Clark-Carter, D., Das Gupta, M., Fradley, E., & Tuckey, M. (2003). Pathways to understanding mind: Construct validity and predictive validity of maternal mind-mindedness. *Child Development*, *74*, 1194–1211. doi:10.1111/1467-8624.00601

Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind-mindedness and attachment security as predictors of theory of mind understanding. *Child Development*, *73*, 1715–1726. doi:10.1111/1467-8624.00501

Muthén, L. K., & Muthén, B. O. (1998–2013). *Mplus user's guide* (7th ed.). Los Angeles, CA: Author.

Nelson, J. A., O'Brien, M., Calkins, S. D., Leerkes, E. M., Marcovitch, S., & Blankson, A. N. (2012). Maternal expressive style and children's emotional development. *Infant and Child Development*, *21*, 267–286. doi:10.1002/icd.748

Ontai, L. L., & Thompson, R. A. (2002). Patterns of attachment and maternal discourse effects on children's emotion understanding from 3 to 5 years of age. *Social Development*, *11*, 433–450. doi:10.1111/1467-9507.00209

Oppenheim, D., & Koren-Karie, N. (2013). The insightfulness assessment: Measuring the internal processes underlying maternal sensitivity. *Attachment & Human Development*, *15*, 545–561. doi:10.1080/14616734.2013.820901

Ornaghi, V., Brockmeier, J., & Grazzani, I. (2014). Enhancing social cognition by training children in emotion understanding: A primary school study. *Journal of Experimental Child Psychology*, *119*, 26–39. doi:10.1016/j.jecp.2013.10.005

Pons, F., & Harris, P. (2000). *Test of emotion comprehension: TEC*. Oxford, UK: Oxford University Press.

Pons, F., & Harris, P. L. (2005). Longitudinal change and longitudinal stability of individual differences in children's emotion understanding. *Cognition & Emotion*, *19*, 1158–1174. doi:10.1080/02699930500282108

Pons, F., Harris, P. L., & de Rosnay, M. (2004). Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization. *European Journal of Developmental Psychology*, *1*, 127–152. doi:10.1080/17405620344000022

Pons, F., Lawson, J., Harris, P. L., & de Rosnay, M. (2003). Individual differences in children's emotion understanding: Effects of age and language. *Scandinavian Journal of Psychology*, *44*, 347–353. doi:10.1111/1467-9450.00354

Raikes, H. A., & Thompson, R. (2008). Conversations about emotion in high-risk dyads. *Attachment & Human Development*, *10*, 359–377. doi:10.1080/14616730802461367

Root, A. K., & Denham, S. A. (2010). The role of gender in the socialization of emotion: Key concepts and critical issues. In A. K. Root & S. A. Denham (Eds.), *Focus on gender: Parent and child contributions to the socialization of emotional competence* (Vol. 128, pp. 1–9). San Francisco, CA: Jossey-Bass.

Saarni, C. (Ed.) (1999). *The development of emotional competence*. New York, NY: The Guildford Press.

Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychopathology. *Social Development*, *17*, 737–754. doi:10.1111/j.1467-9507.2007.00457.x

Sharp, C., Fonagy, P., & Goodyer, I. M. (2006). Imagining your child's mind: Psychosocial adjustment and mothers' ability to predict their children's attributional response styles. *British Journal of Developmental Psychology*, *24*, 197–214. doi:10.1348/026151005X82569

Southam-Gerow, M. A., & Kendall, P. C. (2002). Emotion regulation and understanding – implications for child psychopathology and therapy. *Clinical Psychology Review*, *22*, 189–222. doi:10.1016/S0272-7358(01)00087-3

Sveen, T. H., Berg-Nielsen, T. S., Lydersen, S., & Wichstrøm, L. (2013). Detecting psychiatric disorders in preschoolers: Screening with the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*, 728–736. doi:10.1016/j.jaac.2013.04.010

Tenenbaum, H. R., Alfieri, L., Brooks, P. J., & Dunne, G. (2008). The effects of explanatory conversations on children's emotion understanding. *British Journal of Developmental Psychology*, *26*, 249–263. doi:10.1348/026151007X231057

Tenenbaum, H. R., Visscher, P., Pons, F., & Harris, P. L. (2004). Emotional understanding in Quechua children from an agro-pastoralist village. *International Journal of Behavioral Development*, *28*, 471–478. doi:10.1080/01650250444000225

Wichstrøm, L., Berg-Nielsen, T. S., Angold, A., Egger, H. L., Solheim, E., & Sveen, T. H. (2012). Prevalence of psychiatric disorders in preschoolers. *Journal of Child Psychology and Psychiatry*, *53*, 695–705. doi:10.1111/j.1469-7610.2011.02514.x

Zumbo, B. D., Gadermann, A. M., & Zeisser, C. (2007). Ordinal versions of coefficients alpha and theta for Likert rating scales. *Journal of Modern Applied Statistical Methods*, *6*(1), 21–29.

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# Paper III

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Running head: YOUNG BRAZILIANS' EMOTION UNDERSTANDING

Short title: Young Brazilians' Emotion Understanding

# Young Brazilian Children's Emotion Understanding: A comparison Within and Across Cultures

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**Abstract**

Research on children's emotion understanding (EU) has been dominated by middle-class samples from Western societies. We studied cultural and socioeconomic status (SES) variation in young children's EU in a high SES sample (n = 50) and a low SES sample (n = 50) of Brazilian preschoolers using the Test of Emotion Comprehension. We found that the high SES sample performed better at both the overall and component levels than the low SES sample on EU. The differences were especially substantial for the recognition of basic emotions, with the low SES children recognizing negative emotions better than positive and neutral emotions. In addition, we compared the two SES samples of Brazilian children to same-age samples from Norway, Italy and Peru. Between the Brazilian and the European samples and the Brazilian and other non-European samples, the variation in EU was observed to be more related to SES than to culture.

**Keywords***:* child, culture, emotion understanding, socioeconomic

Young Brazilian Children's Emotion Understanding: A Comparison Within and Across Cultures

## 1. Introduction

The development of children's emotion understanding (EU) is likely to be affected by the cultural and socioeconomic context the child grows up in. Different cultures may promote or constrain aspects of children's EU through cultural norms and values. Chen (2009) argues that examining developmental patterns of socio-emotional functioning from the within-cultural perspective provides a foundation for cross-cultural comparisons. The goal of this study was to examine whether cross-cultural differences in young children's EU are due to differences in the cultural or SES status of the children. Prior to discussing the existing studies on EU in diverse cultures and EU variation according to SES, the various sequences of EU development will be highlighted.

### *1.1 Children's EU in a Component Framework*

EU has been defined as the way we understand, predict and explain our own and others' emotions (Harris, 1989; Saarni, 1999). Models of the development of EU (Halberstadt, Denham, & Dunsmore, 2001; Pons, Harris, & de Rosnay, 2004; Saarni, 1999) describe several aspects of EU or abilities that are part of it, from being able to label emotions to identifying emotion-eliciting situations and understanding more complex sentiments such as ambivalence and moral emotions. Harris (1989) states that it is important to differentiate between the development of children's behavioral expression (experience) and conscious acknowledgement (or understanding) of emotions. This is because the child's experience of emotions happens at an earlier age than the conscious awareness of what they are feeling.

The development of EU is a part of the broader social-cognitive development in children and, specifically, of their language development because recognizing and labeling emotions is also a linguistic process. The EU concept is a composite of nine components (e.g. Pons, Harris, & de Rosnay, 2004), which has been operationalized by Pons and Harris (2000) into the Test of Emotion Comprehension (TEC).

The development of the EU components has been organized by Pons and colleagues in a three-period developmental framework of external, mentalistic and reflective periods of understanding. An overview of the association of components and developmental periods is shown in Table 1.

----insert Table 1 about here----

The *external period* was conceived by Pons et al. (2004) as comprising children's ability to recognize and name emotions on the basis of expressive cues (Recognition), an understanding that their feelings are affected by external events or objects (External) and an understanding of the relationship between memory and emotion (Reminder). The *mentalistic period* is characterized by an ability to connect beliefs to emotions (Belief), distinguish between the expression and experience of emotion (Hiding) and understand that people's emotional reactions depend on their desires (Desire). In the *reflective period*, children acknowledge psychological strategies to maintain control over emotions (Regulation), understand that a person may experience multiple or even contradictory emotional responses to a situation (Mixed) and realize that emotions are linked to both morally reprehensible and praiseworthy actions (Morality).

### *1.2 Socioeconomic Differences in Children's EU*

Lower SES is widely accepted to have a negative effect on the well-being and development of children (Letourneau, Duffett-Leger, Levac, Watson, & Young-Morris, 2013). In a recent meta-analysis, Letourneau et al. (2013) revealed very small to small but significant effects of SES on children's literacy and language, aggression and internalizing behaviors. A review of studies addressing the relationship between SES and socio-emotional development concluded that there is little evidence of the effect of SES on very young children's emotional competence. However, studies of children from early childhood to adolescence have indicated that there is more frequent maladaptive social-emotional functioning in low SES subjects than in high SES subjects (Bradley & Corwyn, 2002). Additionally, the majority of studies have been based on data provided by parents and teachers rather than by the subjects themselves, and socio-emotional competence has often been indicated by emotional problem scores on rating scales rather than by direct measures of EU.

Only a few studies have included SES as a possible predictor of individual differences in children's EU. Some studies find a positive relationship between SES and better EU (Cutting & Dunn, 1999; Dunn & Brown, 1994), and other studies report no effect of SES on preschoolers' EU (Kårstad, Wichstrøm, Reinfjell, Belsky, & Berg-Nielsen, 2015; Molina, Bulgarelli, Henning, & Aschersleben, 2014). The majority of this research is dominated by research on WEIRD middle-class samples, i.e., samples from Western, Educated, Industrialized, Rich, and Democratic societies, which according Henrich, Heine, and Norenzayan (2010), may not be representative populations from which to make generalizations. Thus, the translation and standardization of TEC for different countries and cultures have shown that this measure can be used to achieve a multifaceted examination of cross-

cultural variation. This study was designed to establish a wider basis for EU by assessing children's EU in two samples of Brazilian children with different SES.

*1.3 Culture Variation in Children's EU*

There have been few cross-cultural comparison studies investigating possible cultural differences in children's development of EU. A few studies have investigated EU in non-Western cultures. Avis and Harris (1991) found that Baka children from Cameroon aged 3-5 years showed similar developmental patterns in understanding the Belief component (beliefs affect emotional reaction) and the Desire component (emotional reactions depend on desires) as Western children. In addition, Vinden (1999) compared EU in four different cultures (one Western and three non-Western) in children aged 3-11 years and reported that an understanding of Desire precedes an understanding of Belief, although the rate of this development might be different. Children from Cameroon and Papua New Guinea were shown to develop an understanding of Belief later than Western children.

The cultural disparity in EU may be attributable to differences in emotion socialization (Eisenberg, Cumberland, & Spinrad, 1998). Halberstadt (1991) divides the mechanism of *emotion socialization* into three aspects—how parents show or don't show their emotions, how they teach or don't teach their child about emotions and how they react or don't react to the emotions of others. Brazilian studies that focus on emotion socialization are rare; however, in one recent study of 60 caretaker-child dyads, the researchers found that the caretaker valued the development of the smile as an important emotional expression and emphasized the importance of developing an emotion regulation strategy during the first three years of life (Mendes & Pessôa, 2013). Different emotion socialization practices have been associated with cultures valuing independence and individuation on the one hand and interdependence and group-membership on the other; these cultural values are often called individualism and collectivism, respectively. For example, Brazil, Thailand, Ghana, China and Peru are defined as collectivistic countries, and the United States, Italy, France, England, Germany and Norway are defined as individualistic countries (Hofstede, 1991).

A few studies have compared the EU in non-Western collectivistic cultures to that in Western individualistic cultures (Gardner, Harris, Ohmoto, & Hamazaki, 1988; Joshi & MacLean, 1994). For example, Wang (2008) performed a longitudinal study of children from age 3 to 4.5 and found that Euro-American preschoolers scored higher than Chinese-American preschoolers and that Euro-American children made more rapid progress in understanding External component (feelings are affected by external events or objects) than the Chinese-American children. This difference may be because Euro-American parents often explain the causes of different emotions with their children and encourage them to articulate their emotions, whereas Chinese parents prioritize psychological discipline and behavioral standards over discussing the causes of emotions (Wang & Fivush, 2005).

It is difficult to compare different studies due to methodological differences and the fact that only a few of the nine components of EU are usually included. However, using the TEC allows the EU development of children from different cultures to be compared, and recent studies show that there are some cultural differences when comparing EU at both the overall and component levels. To the best of our knowledge, only one study has compared a non-Western population with a Western population using the TEC. Tenenbaum, Visscher, Pons, and Harris (2004) compared children from a Quechua agro-pastoralist village in Peru with the British sample reported by Pons et al. (2004). They found that the development pattern was similar between the two groups of children, but the overall scores were significantly higher for British children.

In addition, some studies comparing EU using the TEC in Western countries have been reported. One example is the study of Albanese et al. (2006), which involved 4- to 10-year-old Italian children. The findings showed age-related increases in all nine components, but these did not conform fully to the model established by Pons et al. (2004). Specifically, the development of the Desire component (emotional reactions depend on desires) was indicated in the external period for Italian- and in the mentalistic period for British children, whereas indications for the Reminder component (emotional reactions depend on memories) showed the inverse. Finally, in a recent study, Molina et al. (2014) found that Italian children had higher overall TEC scores than German children at ages 3 and 5 and that more Italian preschoolers than German preschoolers understood that expressed emotions may differ from internal emotions (Hiding).

Many of the cross-cultural studies have involved a nesting of SES on cultural factors. The problem is that SES may be a source of variation that is partly independent of culture, and therefore, the effects of SES and culture may be confounded.

*1.4 The Present Study*

The goal of this study was twofold. First, we examine to what extent variation in children's EU is related to socioeconomic factors by comparing Brazilian children aged 3-5 years with different SES backgrounds (high

middle- to upper-class SES versus low middle-class to poverty SES). Previous studies of the effects of SES on cognitive development suggest an expectation that the low SES sample should show a lower EU score than the high SES sample.

Second, we compare the Brazilian children's EU to that of children of the same age from studies using the TEC in both Western and non-Western populations. Previous studies have been conducted using varying methods and have not shown results that can serve as a basis to predict the results of cultural comparisons. However, we expect that collectivistic low SES Brazilian children should be more similar to the collectivistic low SES Peruvian children than the individualistic Norwegian and Italian children.

## 2. Method

### *2.1 Participants*

The participants were 100 children, with 50 in each SES group. In Brazil, educational contexts are clearly aligned with socioeconomic differences: children from the middle class and upward attend private pre-schools, and children from low-income families attend public pre-schools. Public pre-schools in Brazil are fully financed by state governments, whereas private pre-schools are financed by the parents (families), and the costs are tax deductible. The low SES group comprised 30 boys and 20 girls ($M_{age}$ = 4, *SD* = .57), and the high SES group comprised 16 boys and 34 girls ($M_{age}$ = 3.7, *SD* = .55). The high-SES group included a majority of biological mothers (92%), and 75.5% of the parents were married. Additionally, 56% of the parents had undergraduate degrees, and an additional 38% of the parents had completed high school. When we asked how well salaries covered the family's expenses, 74% answered very well, 26% answered well and none of the parents answered not well.

The samples from other studies of children's EU that were compared to the Brazilian sample were: 882 Norwegian children ($M_{age}$ 4.4) (Kårstad, Kvello, Wichstrøm, & Berg-Nielsen., 2014), 114 Italian children ($M_{age}$ 4.8) (Molina et al., 2014) and 18 Peruvian children ($M_{age}$ 6) (Tenenbaum et al., 2004).

Table 2 shows the parents' level of education for the Brazilian high-SES children, Norwegian children and Italian children. We did not have educational information from the low-SES Brazilian and the Peruvian parents.

----insert Table 2 about here----

### *2.2 Procedures*

#### 2.2.1 Data collection

The children were interviewed by two students in the graduate program in social psychology at the Federal University of Paraíba, Brazil. Parents from private and public pre-schools were asked for their children's participation via a consent form after permission was obtained from the leader in the pre-schools. Assent was also required from each participant.

The children were interviewed individually in a separate room. The TEC was adapted to a Brazilian context using a pilot testing procedure that resulted in two changes. First, the scene in the Recognition component, in which the protagonist was described as waiting for the bus, contained the following additional text: *"and the bus is on time"*. This addition was made because the criterion emotion was "neutral", but because Brazilian buses are always delayed and passengers are therefore often angry, the right answer became "angry". Second, the illustration of a fox in the scene for the Desire component was exchanged for a wolf, which is a more familiar animal for Brazilian children.

The stories were told with neutral intonation to avoid interviewer bias. The nine components were presented to the children in a fixed order that corresponded loosely to the presumed order of difficulty of the components. The interviews lasted on average 15 minutes per child. Breaks were provided if the child felt tired. Each participant received a small token of appreciation for their participation at the end of the interview.

A socio-demographic questionnaire was administered only to parents of children in private pre-schools (high SES) because the work hours of parents of children from low-income families restricted their ability to complete the questionnaires during preschool hours in the presence of a researcher.

#### 2.2.2 Data analysis

IBM SPSS Statistics 20 was used for the data analysis. We used a two-way ANOVA on total TEC score with SES and age as two-level independent variables and an independent t-test to compare the TEC score at total and component levels. Cohen's *d* was used to measure effect size (Cohen, 1998), and Pearson's correlation coefficients were used to test associations between the components. We used a two-proportion z-test to compare

the percentage of correct answers between different countries at the TEC component level and to compare the Brazilian children's responses at the item level.

*2.3 Instrument*

EU was assessed using a Brazilian-Portuguese translation (Roazzi , 2007) of the TEC (Pons & Harris, 2000). The Brazilian-Portuguese version was both forward-translated and back-translated by Roazzi (2007). The TEC was designed for children aged 3 to 11 years and consists of a book that includes a test for each of the nine components. The book is in A4 format, and each component is tested using illustrations of either a child (8 situations) or an animal (1 situation) protagonist with blank faces in scenes that are interpreted as emotional situations. The participants' EU was tested by asking them to point to the one of four schematic facial expressions provided below the scene that showed emotions of the protagonist. The facial expressions were happy, normal and two of the following: sad, scared and angry. An example from the test of the External component is shown in Figure 1. The experimenter says "This girl is looking at her little turtle, which has just died". Then, the experimenter asks the child: "How is this girl feeling? Is she happy, sad, angry or normal?" See Pons et al. (2004) for a more detailed description of the TEC.

The reliability of the scoring was assessed with Zumbo, Gadermann, and Zeisser's (2007) Theta test and yielded a value of 0.85. The Theta test was designed to improve on Cronbach's alpha by including categorically ordered data (see also, Gadermann, Guhn, & Zumbo, 2008).

2.3.1 Scoring

Participants were awarded a score for passing a required number of TEC items for each of the nine components. Obtaining a passing score was dependent upon providing the correct response to a minimum of four of the five items in the Recognition and External Cause components, correct responses to all four Desire and both Morality components, and the correct response to the single items in the rest of the components. The maximum score for the test was 9.

*2.4 Ethical Considerations*

The study followed the Ethical Guidelines of the Resolução 466/2012 and was reviewed by the Ethics Committe for Health Sciences of the Universidade Federal da Paraíba (UFPB) under the protocol number: 0167.

----insert Figure 1 about here----

## 3. Results

*3.1 Comparing EU of Low and High SES Children*

An analysis of the effect of SES on EU was performed by a two-way ANOVA on the overall TEC scores with SES and age as two-level independent variables of public vs. private (pre-schools) and younger (n= 32, mean age = 3.2) vs. older children (n= 68, mean age = 4.2), respectively. There was a statistically significant main effect for SES ($F$ (1, 96) = 16.64, $p$ < .001) and age ($F$ (1, 96) = 10.80, $p$ = .001). The high SES children ($M$ = 3.14) had higher scores than the low SES children ($M$ = 1.94), and the older children ($M$ = 2.78) performed better than the younger children ($M$ = 2.03). There were no interaction effects.

Mean scores for each of the SES samples for each of the EU components and the results of t-tests of SES differences are shown in Table 3.

----insert Table 3 about here----

Table 3 indicates that the main effects were primarily due to the differences in scores in the expected direction, in which the high SES children performed better than the low SES children for the Recognition, Desire and Reminder components. The higher mean scores of the high SES children for these components corresponded, respectively, to medium to large Cohen (1998) effect sizes of $d$ = 0.82, $d$ = 0.70, and $d$ = 0.55. The difference in the overall scores corresponded to a medium effect size of $d$ = 0.78. Table 2 also shows markedly higher scores in the expected direction for the External, Regulation, and Morality components, with $t$ scores corresponding to one-tail p values of, respectively, .038, .038, and .093.

Inter-item correlations between components were few and different in the two samples. The analyses of the high SES responses showed Pearson correlations at the p< .01 level for Recognition and External (.29), Desire (.31), and Reminder (.27); between External and Desire (.54); and between Mixed and Morality (.47). Correlations in the low SES group were between Recognition and Hiding (.41), External and Hiding (.39), and Desire and Reminder (.41).

*3.2 Comparison of Brazilian Children's EU with Three Different Countries*

Data from three prior TEC studies could be compared to the present results and are shown in Table 4. We used a two-proportion z-test to compare the percentage of correct answers at the component level.

----insert Table 4 about here----

The results in Table 4 indicate that EU is related to SES because similar responses at both the component and overall levels are observed for samples associated with stable and relatively high living standards, such as the European samples and the high SES Brazilian group; a lower percentage of correct answers at the component level and lower overall mean values could be associated with lower living standards and poverty, such as for the Quechua children in Peru and the low SES children in Brazil.

Because the low SES Brazilian children scored very low on Recognition, we examined the percentage of correct answers to the five Recognition items (happy, normal, sad, scared and angry). High SES children showed better recognition of the emotions "happy" (80 % vs. 50 %) and "normal" (58 % vs. 38 %) compared to the low SES children ($p < .05$). There were no significant differences between the two SES groups regarding the recognition of negative emotions.

We also analyzed the Brazilian children's responses to the External component because this component was significantly lower both for the high SES and low SES children when compared to children from Norway and Italy. Two of the items stand out: first, the item where a child is receiving a birthday present, and one would expect the child to respond with "happy". The high SES children answered "happy" (62 %), "sad" (12 %), "normal" (12 %) and "scared" (12 %), whereas the low SES children answered "happy" (36 %), "sad" (10 %), "normal" (20 %) and "scared" (34 %). Comparing the "happy" responses of the high and low SES samples revealed a significant difference ($p < .05$). Additionally, the item showing the child waiting for the bus that is on time, where one would expect the child to respond with the emotion "normal", we found that the high SES children responded "normal" (16 %), "happy" (20 %), "sad" (40 %) and "angry" (24 %) and that the low SES children responded "normal" (42 %), "happy" (20 %), "angry" (16 %) and "sad" (22 %). The difference in the percent responding "normal" between the two groups was also significant ($p < .05$).

## 4. Discussion

The results from this study showed that the main differences in EU between the Brazilian and European children and between the Brazilian and non-European children were related to SES rather than to culture. This finding may confirm the assumption that SES has an effect on children's EU that is partly independent of culture. Hence, in future studies involving cross-cultural comparisons of EU, this factor should be controlled for.

This study also showed that in the Brazilian samples, there are differences in EU between the high and low SES children. This finding is similar to those of other studies investigating children's socio-emotional development during early childhood (Bradley & Corwyn, 2002). The SES differences were present both at the component and overall level of the TEC interview, especially in the recognition of emotion names (Recognition) and the understanding of the effects of desires (Desire) and past information (Reminder) on emotions. The scores of the low SES children on these components suggest that emotions are not cognized (or represented) to the same degree as in high SES children. Parents with lower SES use more physical punishment and do not discuss the consequences of different behaviors and emotions (Hoff, Laursen, & Tardif, 2002), and previous research has linked this authoritarian parenting style to reduced emotional-social competences in children (Steinberg, 2001). However, similarities were also between the Brazilian samples, such as relatively high scores on the Belief, Hiding and Mixed components and relatively low scores on the External component. The analyses of the responses to the External component may indicate that the story about the bus may contribute to the low percentage of high SES Brazilian children providing the correct answer because in Brazil, many of middle class children do not take the bus. Alternatively, the information about the bus *being on time* may have been ignored, and the children may have responded with sad instead of normal because they had to take a bus instead of being driven.

In the developmental literature researchers suggest that the recognition of the emotion *happy* is the easiest and that the recognition of *angry* and *sad* emotions develop later (Felleman, Carlson, Barden, Rosenberg, & Masters, 1983; Reichenbach & Masters, 1983). However, Izard (1971) found that the recognition of the emotion *angry* developed as early as the recognition of *happy*. Our results revealed an intriguing result: the low SES Brazilian children had more problems identifying positive and neutral emotions than negative emotions. One plausible but somewhat sad explanation may be that the low SES children are simply more familiar with negative emotions than positive ones, e.g., a birthday present may be a source of disappointment rather than joy.

The high SES Brazilian children's EU responses in this study were similar to those of children in European countries. This was evident at both the overall and component levels of EU, which showed similar variation in

scores. However, there were some exceptions. For example, the Norwegian children were better than the high SES Brazilians on Recognition and External, whereas the high SES Brazilian children performed better than the Norwegians on Reminder. Additionally, the Italian children performed better on External than the high SES Brazilians, and the high SES Brazilian children acknowledged Mixed and Moral emotions better than the Italians. The difference in Recognition was not very large, and as previously mentioned, the low score on External could be attributed to misinterpretation of the interview material.

Conversely, the low SES Brazilians showed lower performance than the Norwegian and/or the Italian children on four of the nine components, but showed the same pattern of low scores on the majority of the easiest components (Recognition, External, Reminder and Desire) as the Peruvian low SES sample. This finding was expected because the low SES Brazilian children are more similar to the Peruvians in both SES and cultural values than to the European children. However, because of the low N in the analysis of the Peruvian sample and the higher mean age of the children compared with the other samples, more research applying the TEC in non-Western countries is needed to effectively address this topic. Additionally, since we compared only the TEC scores from the studies from different countries, we did not control our comparison for possible SES differences. However, as shown in Table 2, it appears as though the Brazilian high SES sample and the Norwegian sample were very similar regarding SES level, while the Italian parents seemed to have a lower educational level.

The results from this study raise some doubts regarding the relevance of the three periods in EU development illustrated in Table 1. The correlations between components shown in this study were generally low. Furthermore, an ordered sequence of gradually lower scores for components in the hypothesized "later" or "more developed" periods were not evident in the two Brazilian samples in this study. In fact, the results from this study and those obtained using four other samples (Kårstad et al., 2014; Molina et al., 2014; Pons et al., 2004; Tenenbaum et al., 2004) show that Recognition is the only component that stands out as easier to develop than all the others. Scores for the other components generally show little variation with frequent and unsystematic juxtaposition compared to an idealized normative sequence. This observation suggests that studies of construct validity should be a priority in future research on and with the TEC interview.

When a socially handicapped group, such as low SES Brazilian children, is tested by persons and procedures belonging to the relatively well-off part of the community, one should be aware of potential sources of bias, such as using test materials that underestimate the competence of one group relative to another. The probability of a differential effect caused by the procedure may, however, be low in this case because all children were tested in familiar surroundings (their pre-schools). The interviewers, who tested an equal number of children in private and public pre-schools, reported that all children were eager to participate and that there were no signs of SES-related differences in their motivation.

The practical implications of this study are that children's SES may contribute to large individual differences in EU, even if they live in the same culture. Our findings show that low SES Brazilians have problems recognizing basic emotions (especially positive and neutral emotions), which are regarded in the literature as the easiest components. This finding raises a question regarding whether the lives of low SES children are less characterized by positive emotions. One can already see at this age what is evident in youth and adults—that low SES is connected with more symptoms of dysthymia and depression (Gilman, Kawachi, Fitzmaurice, & Buka, 2002). This knowledge could be relevant for both parents and teachers who socialize with preschoolers on a daily basis. Naming and experiencing positive emotions are thus an important issue for these children, and knowing how important children's EU is for their social and mental competence makes prioritizing naming and experiencing positive emotions a good investment in children's future mental health. Future research on children's EU should include observational measures of parent-child interaction and questionnaires about parents' emotion-related beliefs when comparing children from different cultures. Although individual differences in EU at the group level are quite stable (Pons & Harris, 2005), recent studies have shown that intervention programs in pre-schools providing direct training regarding the understanding of emotions enhances children's EU according to the TEC (Domitrovich, Cortes, & Greenberg, 2007; Gavazzi & Ornaghi, 2011).

## 5. References


Albanese, O., Gavazzi, I. G., Molina, P., Antoniotti, C., Arati, L., Farina, E., & Pons, F. (2006). Children´s emotion understanding: Preliminary data from the Italian validation project of Test of Emotion Comprehension (TEC). In F. Pons, M. F. Daniel, L. Lafortune, P. A. Doudin & O. Albanese (Eds.), *Toward emotional comptetences* (pp. 39-53). Aalborg: Aalborg University Press.

Avis, J., & Harris, P. L. (1991). Belief-desire reasoning among Baka children: Evidence for a universal conception of mind. *Child Development, 62*(3), 460. http://dx.doi.org/10.1111/j.1467-8624.1991.tb01544.x

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371-399. http://dx.doi.org/10.1146/annurev.psych.53.100901.135233

Braun, M., & Müller, W. (1997). Measurement of education in comparative research. *Comparative Social Research, 16*, 163-201.

Chen, X. (2009). Culture and early socio-emotional development. In R. E. Tremblay, M. Boivin & R. D. V. Peters (Eds.), *Encyclopedia on early childhood development* (pp. 1-6). Montreal, Quebec: Centre of Excellence for Early Childhood Development and Strategic Knowledge Cluster on Early Child Development.

Cohen, J. (1998). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, N. J: Laurence Erlbaum Associates.

Cutting, A. L., & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences and interrelations. *Child Development, 70*(4), 853-865. http://dx.doi.org/10.1111/1467-8624.00061

Domitrovich, C. E., Cortes, R. C., & Greenberg, M. T. (2007). Improving young children's social and emotional competence: a randomized trial of the preschool "PATHS" curriculum. *The Journal of Primary Prevention, 28*(2), 67-91. http://dx.doi.org/10.1007/s10935-007-0081-0

Dunn, J., & Brown, J. (1994). Affect expression in the family, childrens understanding of emotions, and their interactions with others. *Merrill-Palmer Quarterly-Journal of Developmental Psychology, 40*(1), 120-137.

Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry, 9*(4), 241-273. http://dx.doi.org/10.1207/s15327965pli0904_1#.V2r9UvkrLIU

Felleman, E. S., Carlson, C. R., Barden, R. C., Rosenberg, L., & Masters, J. C. (1983). Children's and adults' recognition of spontaneous and posed emotional expressions in young children. Developmental Psychology, 19(3), 405-413. http://dx.doi.org/10.1037/0012-1649.19.3.405

Gadermann, A., Guhn, M., & Zumbo, B. D. (2008). An empirical comparison of Cronbach's alpha with ordinal reliability coefficients alpha and theta. *International Journal of Psychology, 43*(3-4), 55-55.

Gardner, D., Harris, P. L., Ohmoto, M., & Hamazaki, T. (1988). Japanese children's understanding of the distinction between real and apparent emotion. *International Journal of Behavioral Development 11*(2), 203-218. http://dx.doi.org/10.1177/016502548801100204

Gavazzi, I. G., & Ornaghi, V. (2011). Emotional state talk and emotion understanding: a training study with preschool children. *Journal of Child Language, 38*(5), 1124-1139. http://dx.doi.org/10.1017/S0305000910000772

Gilman, S. E., Kawachi, I., Fitzmaurice, G. M., & Buka, S. L. (2002). Socioeconomic status in childhood and the lifetime risk of major depression. *International Journal of Epidemiology, 31*(2), 359-367. http://dx.doi.org/10.1093/ije/31.2.359

Halberstadt, A. G. (1991). Toward an ecology of expressiveness: Family expressiveness in particular and a model in general. In R. S. Feldman & B. Rimé (Eds.), *Fundamentals of nonverbal behavior* (pp. 106-160). Cambridge: Cambridge University Press.

Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. Social Development, 10(1), 79-119. http://onlinelibrary.wiley.com/doi/10.1111/1467-9507.00150/abstract

Harris, P. L. (1989). *Children and emotion. The development of psychological understanding*. NY: Basil Blackwell.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2-3), 61-83. http://dx.doi.org/10.1017/S0140525X0999152X

Hoff, E., Laursen, B., & Tardif, T. (2002). Socioeconomic status and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting* (2nd ed., Vol. 2: Biology and ecology of parenting, pp. 231-252). Mahwah, NJ: Erlbaum.

Hofstede, G. (1991). *Cultures and organizations: Software of the mind*. London: MacCraw-Hill.

Izard, C. (1971). The face of emotion. New York: Appleton-Century Crofts.

Joshi, M. S., & MacLean, M. (1994). Indian and English children's understanding of the distinction between real and apparent emotion. *Child Development, 65*(5), 1372-1384. http://dx.doi.org/10.1111/j.1467-8624.1994.tb00822.x

Kårstad, S. B., Kvello, Ø., Wichstrøm, L., & Berg-Nielsen, T. S. (2014). What do parents know about their children's comprehension of emotions? Accuracy of parental estimates in a community sample of preschoolers. *Child: Care, Health and Development, 40*(3), 346-353. http://dx.doi.org/10.1111/cch.12071

Kårstad, S. B., Wichstrøm, L., Reinfjell, T., Belsky, J., & Berg-Nielsen, T. S. (2015). What enhances the development of emotion understanding in young children? A longitudinal study of interpersonal predictors. *British Journal of Developmental Psychology*. http://dx.doi.org/10.1111/bjdp.12095

Letourneau, N. L., Duffett-Leger, L., Levac, L., Watson, B., & Young-Morris, C. (2013). Socioeconomic status and child development: A meta-analysis. *Journal of Emotional and Behavioral Disorders, 21*(3), 211-224. http://dx.doi.org/10.1177/1063426611421007

Mendes, D. M. L. F., & Pessôa, L. F. (2013). Emotion, affection and maternal speech in parental care. In M. L. Seidl-De-Moura (Ed.), *Parenting in South American and African contexts* (pp. 129-145). Brazil: InTech.

Molina, P., Bulgarelli, D., Henning, A., & Aschersleben, G. (2014). Emotion understanding: A cross-cultural comparison between Italian and German preschoolers. *European Journal of Developmental Psychology, 11*(5), 592-607. http://dx.doi.org/10.1080/17405629.2014.890585

Pons, F., & Harris, P. L. (2000). *Test of emotion comprehension (TEC)*. Oxford: University of Oxford.

Pons, F., & Harris, P. L. (2005). Longitudinal change and longitudinal stability of individual differences in children's emotion understanding. *Cognition & Emotion, 19*(8), 1158-1174. http://dx.doi.org/10.1080/02699930500282108

Pons, F., Harris, P. L., & de Rosnay, M. (2004). Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization. *European Journal of Developmental Psychology, 1*(2), 127-152. http://dx.doi.org/10.1080/17405620344000022

Reichenbach, L., & Masters, J. C. (1983). Children's use of expressive and contextual cues in judgments of emotion. Child Development, 54(4), 993-1004. http://dx.doi.org/10.2307/1129903

Roazzi , M. (2007). *TEC – Versão em Português* Universidade Federal de Pernambuco.

Saarni, C. (Ed.). (1999). *The development of emotional competence*. NY: The Guildford Press.

Steinberg, L. (2001). We know some things: parent-adolescent relationship in retrospect and prospect. *Journal of Research on Adolescence, 11*(1), 1-19.

Tenenbaum, H. R., Visscher, P., Pons, F., & Harris, P. L. (2004). Emotional understanding in Quechua children from an agro-pastoralist village. *International Journal of Behavioral Development, 28*(5), 471-478. http://dx.doi.org/10.1080/01650250444000225

Vinden, P. G. (1999). Children's understanding of mind and emotion: A multi-culture study. *Cognition & Emotion, 13*(1), 19-48. http://dx.doi.org/10.1080/026999399379357

Wang, Q. (2008). Emotion knowledge and autobiographical memory across the preschool years: A cross-cultural longitudinal investigation. *Cognition, 108*(1), 117-135. http://dx.doi.org/10.1016/j.cognition.2008.02.002

Wang, Q., & Fivush, R. (2005). Mother-child conversations of emotionally salient events: Exploring the functions of emotional reminiscing in European American and Chinese Families. *Social Development, 13*(2), 473-495. http://dx.doi.org/10.1111/j.1467-9507.2005.00312.x

Zumbo, B. D., Gadermann, A. M., & Zeisser, C. (2007). Ordinal versions of coefficients alpha and theta for Likert rating scales. *Journal of Modern Applied Statistics 6*, 21-29. Available at: http://digitalcommons.wayne.edu/jmasm/vol6/iss1/4

Table 1. Nine Components of EU by Age and Skills

| Level | Component | Skill |
|---|---|---|
| External period | Recognition (3 - 4 y. o.) | Recognize and name the basic emotions. |
| | External (3 - 4 y. o.) | Understand how external causes affect emotions in others. |
| | Reminder (3 - 6 y. o.) | Understand the effect of past information on emotions. |
| Mentalistic period | Desire (3 - 5 y. o.) | Understand the effect of desires on the emotional reactions of others. |
| | Belief (4 - 6 y. o.) | Understand the effect of beliefs (true or false) on the emotional reactions of others. |
| | Hiding (4 - 6 y. o.) | Understand the differences between the outwardly expressed emotion and the actual, inwardly experienced emotion. |
| Reflective period | Regulation (8 y. o.) | Understand the effectiveness of using cognitive strategies to maintain control over emotions. |
| | Morality (+/- 8 y. o.) | Understand that emotions are linked to both morally reprehensible actions and praiseworthy actions. |
| | Mixed (+/- 8 y. o.) | Understand that a person may experience multiple emotions in response to a single situation. |

*Note.* The description is based on Pons et al. (2004).

Table 2. Parents' Level of Education (%) for the Brazilian High-SES Children, Norwegian Children and Italian Children

| | Primary schooling | Secondary schooling | Higher education |
|---|---|---|---|
| Brazil High SES | 6 % | 14 % | 80 % |
| Norway | 7 % | 19 % | 74 % |
| Italy | 55 % | 33 % | 8 % |

*Note:* The classification is based on the Comparative Analysis of Social Mobility in Industrial Nations (CASMIN) classification (Braun & Müller, 1997).

Table 3. Mean EU Overall and Component Scores and T-tests for Differences of High and Low SES Brazilian Samples (n= 50 in all instances)

| | High SES | Low SES | |
|---|---|---|---|
| Components | M (SD) | M (SD) | t (df) |
| Recognition | .70 (.46) | .32 (.47) | 4.068*** (98) |
| External | .26 (.44) | .12 (.33) | 1.795 (90) |
| Reminder | .54 (.50) | .28 (.45) | 2.713 ** (97) |
| Desire | .28 (.45) | .06 (.24) | 3.032** (74) |
| Belief | .32 (.47) | .32 (.47) | .000 (98) |
| Hiding | .32 (.47) | .34 (.48) | -.211 (98) |
| Regulation | .26 (.44) | .12 (.33) | 1.795 (90) |
| Morality | .14 (.35) | .06 (.24) | 1.332 (87) |
| Mixed | .32 (.47) | .32 (.47) | .000 (98) |
| Overall TEC | 3.14 (1.70) | 1.94(1.38) | 3.876*** (98) |

*Note.* * = p <.05, **= p < .01, *** = p <.001

Table 4. Percentage of Correct Answers for Each Component and Mean Overall TEC Comparison of Samples from Brazil, Norway, Italy and Peru

| Country | Brazil High SES | Brazil Low SES | Norway | Italy | Peru | Two Proportion Z Test |
|---|---|---|---|---|---|---|
| Age (M) | 3-5 (3.7) | 3-5 (4) | 4-5 (4.4) | 3-6 (4.8) | 4-7 (6) | |
| Recognition | 70 (84) | 32 (66) | 88 | 72 | 56 | B-high vs. N** and P*/B-low vs. N and I** |
| External | 26 (50) | 12 (36) | 49 | 50 | 28 | B-high and B-low vs. N and I** |
| Reminder | 54 | 28 | 35 | 42 | 22 | B-high vs. N** and P** |
| Desire | *40* | *18* | *52* | 43 | 6 | B-high vs. P**/B-low vs. N and I** |
| Belief | *34* | *38* | *27* | 37 | 33 | |
| Hiding | 32 | 34 | 43 | 48 | 22 | |
| Regulation | 26 | 12 | 30 | 30 | 22 | B-low vs. N** |
| Morality | *54* | *38* | *43* | 35 | 6 | B-high vs. I*/B-low vs. I** |
| Mixed | 32 | 32 | 24 | 13 | 28 | B-high and B-low vs I** |
| Overall TEC (SD) | 3.14 (1.7) | 1.94 (1.4) | 3.35 (1.3) | 3.70 (2.0) | 2.33 (1.1) | |
| N | 50 | 50 | 882 | 114 | 18 | |

*Note*: Data for Norway (N) are based on Kårstad et al. (2014), for Italy (I) on Molina et al. (2014) and for Peru (P) on Tenenbaum et al. (2004). The Peru sample used less strict scoring criteria for the Recognition and External components. The number in brackets is the recoded Brazilian data adapted to the Peruvian scoring criteria. The Italian sample included normal as the correct answer to the Belief component (in addition to happy). The Italian and Peruvian samples included two test items instead of four for Desire, and one test item instead of two for Morality. The Brazilian and Norwegian data in italics were recoded following the same scoring criteria as those used in Italy. Brazil High SES = B-high, and Brazil Low SES = B-low. * = $p < .05$, ** = $p < .01$

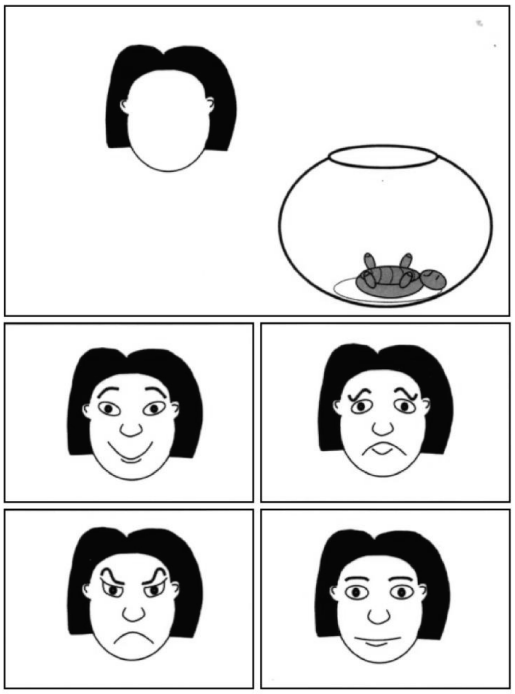

*Figure 1.* Example of an emotional situation for the External component.

# APPENDIX

Table A.

*Summary of Main Instruments Used in the Current Thesis, Specifying whether a Given Measure was Treated as an Outcome Variable, Predictor, Covariate in Study I, II, and III*

| **Measure** | **Target concept** | **Method** | **Independent variable/ Predictor** | **Outcome** | **Covariate** |
|---|---|---|---|---|---|
| Test of Emotion Comprehension (TEC) | Emotion understanding (EU) /Emotion comprehension (EC) | Child-report | Study I | Study II<br>Study III | |
| Peabody Picture Vocabulary Test (PPVTIII) | Verbal skills/ Language comprehension | Structured assessment<br>Child-report | Study I | | Study II |
| Social Skills Rating System teacher report (SSRS-T) | Social skills | Rating scale<br>Teacher report | Study II | | |
| Emotional Availability Scale | Parental Emotional Availability/Parent-child interaction | Observation of parent-child interaction | Study I<br>Study II | | |
| Accuracy of Parental mentalization | Accuracy of Parental mentalization/ accuracy of parental estimation of children's EU | Parent's estimation of their child's responses to the items in TEC compared to the child's actual TEC score | Study II | Study I | |
| Strengths and Difficulties Questionnaire (SDQ) | Child mental health | Parent report | Study I | | |

# *Samtykkeerklæring*

Jeg er blitt informert skriftlig og muntlig om undersøkelsen

## "Tidlig trygg i Trondheim"

Jeg er også blitt informert om formålet med undersøkelsen. Jeg er kjent med at dataene om meg og mitt barn blir behandlet strengt fortrolig og at undersøkelsen er godkjent av Datatilsynet. Undersøkelsen er forelagt Den regionale komité for medisinsk forskningsetikk. Jeg er videre kjent med at det ikke er satt noen spesiell tidsbegrensning for hvor lenge opplysningene om meg og mitt barn kan lagres. Jeg kan på et senere tidspunkt be om å bli slettet fra registeret uten grunn.

Jeg samtykker i at jeg og mitt barn deltar i undersøkelsen.

Barnets navn:……

Trondheim, …….. (dato)

……
Underskrift foresatt

# Forespørsel om deltakelse i forskningsprosjektet

## *"Gener og miljø i barns sosiale utvikling"*

**Bakgrunn og hensikt**
Dette er et spørsmål til deg om å delta i **nye undersøkelser** i forskningsstudien ***Tidlig trygg Trondheim*** for å undersøke barns psykiske og sosiale utvikling i forhold til: 1) hvordan gener samvirker med miljøfaktorer, 2) fysisk aktivitet, 3) hjerterytme og 4) evnenivå. Vi spør alle deltagere i Tidlig trygg i Trondheim, både foresatte og barn, om å delta. Miljøfaktorene er de opplysningene vi tidligere har samlet inn og vil komme til å samle inn i prosjektet, slik som spørreskjemaopplysninger fra deg og fra barnehagen/skolen, undersøkelser av barnet, eventuelle registeropplysninger og filmopptak av barnet og deg.

**Hva innebærer studien?**
Du har allerede deltatt i en tidligere undersøkelse når barnet var 4 år. Undersøkelsen denne gang vil bli lik den forrige, men med noen utvidelser. Utvidelsen består i at vi vil ta en spyttprøve av deg og av barnet ditt. Denne vil bli brukt til å undersøke mulige genetiske forhold som kan være viktige for psykologisk og sosial utvikling. I tillegg vil vi undersøke hjerterytmen hos barnet ditt, samt noen flere undersøkelser av barnets evner. Undersøkelse av hjerterytme innebærer at vi vil feste noen elektroder på kroppen til barnet og at det vil bære en elektronisk sender mens dere er her. For å undersøke det fysiske aktivitetsnivået hos barnet ber vi om at hun/han bærer en liten måler som festes rundt livet (akselerometer) i 7 dager og returnere den til oss etter det.

**Mulige fordeler og ulemper**
Noen barn kan ha vansker med å få samlet nok spytt. Da vil vi gi dem et ufarlig smaksstoff som gjør at det produseres mer spytt. Elektrodene kan kjennes litt kalde mot kroppen med en gang, men dette går fort over. Prøvene innebærer ikke noen direkte fordeler for deg og barnet ditt utover det at dere er med på å gi kunnskap som kan være viktige for å forstå barns utvikling. Alle som deltar får en kompensasjon på kr. 300,- og er med i en trekning om en valgfri ferie for familien til kr. 40 000,-.

**Hva skjer med prøvene og informasjonen om deg?**
Prøvene tatt av deg og barnet, og informasjonen som registreres om deg og barnet, skal kun brukes slik som beskrevet i hensikten med studien. Alle opplysningene og prøvene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En tallkode knytter barnet ditt og deg til opplysninger og prøver fra dere gjennom en navneliste. Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg. Etter godkjenning fra Datatilsynet vil opplysningene om deg og ditt barn kunne kobles med opplysninger om deg og ditt barn fra offentlige registre omkring sosiale, utdanningsmessige og helsemessige forhold, slik som FD-trygd, Norsk UtdanningsData Base, Medisinsk fødselsregister, Norsk pasientregister, Reseptbelagt medikamentregister, straffe- og bøteregistrene, samt med opplysninger fra undersøkelse og prøver på helsestasjon, barnehage og skole. Det vil ikke være mulig å identifisere deg eller ditt barn i resultatene av studien når disse publiseres.

**Frivillig deltakelse**
Det er frivillig å delta i studien. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta. Dersom du ønsker å delta i dette tillegget til Tidlig trygg i Trondheim, undertegner du samtykkeerklæringen på baksiden. Om du nå sier ja til å delta, kan du senere trekke tilbake ditt samtykke uten at det har noen konsekvenser for deg eller barnet ditt. Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte Heidi Birkelund på telefunnummer 948 84 004.

**Ytterligere informasjon om studien finnes i kapittel *A*** – *utdypende forklaring av hva studien innebærer.*
**Ytterligere informasjon om biobank, personvern og forsikring finnes i kapittel B** – *Personvern, biobank, økonomi og forsikring.*

**Samtykkeerklæring følger etter kapittel B.**

### *Kapittel A- utdypende forklaring av hva studien innebærer*

Denne runden av Tidlig trygg i Trondheim har fire nye undersøkelser:
1. Tidligere forskning har antydet at noen typer gener kan påvirke effekten av miljøets betydning for barns psykologiske og sosiale utvikling. Slik sett kan noen barn være mer formbare eller robuste overfor oppvekstmiljøet. Akkurat hvilke gener som kan ha en slik betydning, og hvilke miljøforhold de samvirker med, har vi i dag liten kunnskap om. Det er dette vi har til hensikt å undersøke i denne tilleggsstudien til Tidlig trygg

i Trondheim. For å undersøke genene (DNA) trenger vi spytt fra deg og fra barnet. Spyttprøvene fryses ned og analyseres for DNA på et senere tidspunkt.
2. Det er også grunn til å tro at barnets kognitive (tenkemessige) evner har betydning for sosialt samspill med andre og tilpasning til bl.a. skolen. Vi vil derfor undersøke barnets generelle evner og spesielle evner knyttet til konsentrasjon og oppmerksomhet.
3. Barn varierer med hensyn til hvor lett de blir aktivert følelsesmessig, noen reagerer veldig lett mens andre har en høyere terskel. Hvor lett man reagerer, kan påvirke samspillet med andre og ha betydning for den mentale helsen. Undersøkelse av hjerterytme sier noe om hvor følelsesmessig aktivert en person er.
4. Grunnlaget for en persons fysiske aktivitetsmønster og vekt synes for mange å legges tidlig i livet. For barn er foreldrenes aktivitets- og kostholdsmønster særlig viktige. Vi vil derfor undersøke aktivitetsmønsteret til barnet. Dette gjøres ved å bære en måler som festes i livet i 7 dager. Etter disse 7 dagene sendes denne tilbake til NTNU i frankert konvolutt.

***Kapittel B - Personvern, biobank, økonomi og forsikring***

**Personvern**
Opplysninger som registreres om deg og ditt barn i form av genanalyser og andre undersøkelser vil bli koblet mot de opplysningene som du selv og barnet ditt tidligere har gitt i "Tidlig trygg i Trondheim". I de tilfeller du har samtykket til at opplysningene om deg og ditt barn kan kobles med offentlige registre, nærmere bestemt FD-trygd, Norsk UtdanningsData Base, Medisinsk fødselsregister, Norsk pasientregister, Reseptbelagt medikamentregister, straffe- og børteregistrene, samt med opplysninger fra undersøkelse på helsestasjon, barnehage og skole, vil de nye målingene også kobles mot disse. NTNU ved rektor er databehandlingsansvarlig.
**Biobank**
Spyttprøvene som blir tatt og informasjonen utledet av dette materialet vil bli lagret i en forskningsbiobank ved NTNU. Hvis du sier ja til å delta i studien, gir du også samtykke til at det biologiske materialet og analyseresultater inngår i biobanken. Dr. med. Olav Linaker er ansvarshavende for forskningsbiobanken. Biobanken planlegges å vare til 2020. Etter dette vil materiale og opplysninger bli destruert og slettet etter interne retningslinjer.
**Rett til innsyn og sletting av opplysninger om deg og sletting av prøver**
Hvis du sier ja til å delta i studien, har du rett til å få innsyn i hvilke opplysninger som er registrert om deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene vi har registrert. Dersom du trekker deg fra studien, kan du kreve å få slettet innsamlede prøver og opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner.
**Økonomi**
Studien og biobanken er finansiert gjennom forskningsmidler fra Norges forskningsråd og av NTNU.
**Forsikring**
NTNU er selvassurandør.
**Informasjon om utfallet av studien**
Alle deltagere vil få tilsendt opplysninger om resultatene av undersøkelsen i form av nyhetsbrev.

# Samtykke til deltakelse i studien

Jeg er villig til å delta i studien og samtykker til at mitt barn kan delta

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(Signert av prosjektdeltaker, dato)

Jeg bekrefter å ha gitt informasjon om studien

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(Signert, rolle i studien, dato)

**TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO**
**Autorização dos Pais para Participação das Crianças**

Prezado (a) Senhor (a),

Esta pesquisa é sobre compreensão emocional em crianças de três a cinco anos de idade. A pesquisa está sendo desenvolvida por Pollyana de Lucena Moreira e Eloá Losano de Abreu, alunas do Curso de Psicologia da Universidade Federal da Paraíba, sob a orientação do Prof. Dr. Júlio Rique Neto.

Os objetivos do estudo são verificar: (a) a compreensão das emoções em crianças de três a cinco anos de idade e (b) a relação entre a compreensão das emoções com sintomas emocionais, problemas de conduta, hiperatividade e dificuldade de atenção, problemas de relacionamento social com os pares e comportamento pró-social. Com este trabalho, espera-se contribuir com intervenções clínicas e educacionais que possam para ajudar as crianças a obterem um melhor controle das emoções.

Solicitamos a colaboração de seu filho(a) em responder a uma entrevista verbal sobre compreensão das emoções. A entrevista é curta e leva cerca de 20 minutos para ser concluída. Como também, solicitamos sua autorização para apresentar os resultados deste estudo em eventos da área de psicologia e publicar em revista científica. Por ocasião da publicação dos resultados, seu nome e os nomes das crianças serão mantidos em sigilo. Informamos que essa pesquisa não oferece riscos, previsíveis para a saúde ou mesmo desconforto emocional.

Esclarecemos que a participação de seu filho(a) no estudo é voluntária e, portanto, durante a entrevista, ele ou ela não será obrigado(a) a colaborar com as atividades. Caso ele ou ela decida não participar do estudo, ou resolver a qualquer momento desistir do mesmo, não sofrerá nenhum dano.

Os pesquisadores estarão a sua disposição para qualquer esclarecimento que considere necessário em qualquer etapa da pesquisa. Caso necessite de maiores informações sobre o presente estudo, favor ligar para Júlio Rique Neto no Departamento de Psicologia da Universidade Federal da Paraíba pelo Telefone: (83) 3216-7337/3216-7006 ou email: julio.rique@uol.com.br

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Diante do exposto, declaro que fui devidamente esclarecido(a) e dou o consentimento para meu filho(a) participar da pesquisa e para publicação dos resultados.

Nome do Responsável Legal pela criança: _____
Nome da Criança: _____

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Assinatura do Responsável pela Criança