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## Emotions and the psychosocial development of children with and without developmental language disorder

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General Discussion.



Children and adolescents with Developmental Language Disorder (DLD) are at increased risk for the development of psychosocial problems compared to their peers without DLD (Durkin & Conti-Ramsden, 2010; Yew & O'Kearney, 2013). There is much individual variation within the group of children with DLD regarding their level and development of psychosocial problems (Beitchman et al., 1996; Conti-Ramsden et al., 2018; Lindsay & Dockrell, 2012; St Clair, Pickles, Durkin, & Conti-Ramsden, 2011). However, there is no systematic relationship between the severity of children's communication problems and their psychosocial problems (Charman et al., 2015; St. Clair et al., 2011; Sullivan et al., 2016; Wadman et al., 2011). Therefore, we aimed to examine the extent to which emotional competence might explain these individual differences in psychosocial problems.

Emotional competence refers to the ability to recognise, understand, regulate, and express emotions adaptively in social interactions (Denham, Caverly, & Schmidt, 2002; Saarni, 1999). Emotional competence is gained through social interactions, in which language plays an important role (Brinton & Fujiki, 2011; Dunn, Brown, & Beardsell, 1991; Eisenberg, Sadovsky, Spinrad, 2003; Rieffe, Dirks, Van Vlerken, & Veiga, 2016; Saarni, 1999; Schaffer, 2005). Notably, the development of emotional competence is often delayed in children with DLD (Bakopoulou & Dockrell, 2016; Botting & Conti-Ramsden, 2008; Fujiki, Spackman, Brinton, & Hall, 2004). In children without DLD, problems in emotional competence are important risk factors for the development of different psychosocial problems (Gross & Jazaieri, 2014; Fernandez & Johnson, 2016; Rieffe, Oosterveld, Miers, Meerum-Terwogt, & Ly, 2008), which may also be the case in children with DLD. Therefore, we hypothesized that children with DLD had more difficulties developing their emotional competence, which in turn would contribute to the prediction of their psychosocial problems. Moreover, we expected that children who developed their emotional competence across time, would experience decreasing levels of psychosocial problems.

Problems in emotional competence may become a stronger predictor for psychosocial problems than the severity of children's communication problems, because problems in emotional competence also influence the social learning opportunities of children (Eisenberg et al., 1993). When children are less emotionally competent, they have fewer positive interactions with their social surroundings, which further diminishes their opportunities to develop their emotional competence (Banerjee et al., 2011; Fink, Begeer, Peterson, Slaughter, & De Rosnay, 2015). In this way, problems in emotional competence may start to overshadow the communication problems of children and adolescents with DLD, which would make emotional competence an important area for interventions.

In the current project, we examined; *a.* the level and development of different psychosocial problems of children between 8 and 16 years old with DLD compared to their peers without DLD; *b.* the level and development of emotional competence in children with and without DLD; *c.* the extent to which individual differences in psychosocial problems could be explained by the level and development of children's emotional competence and whether

these relations were moderated by DLD and; *d.* the extent to which emotional competence mediated the relations between the severity of children's communication problems and psychosocial functioning. We examined children between 8 and 16 years old, because during this age range, children are increasingly focussed on the relations with their peers and are especially sensitive to negative evaluations of others, which may have a strong effect on the development of psychosocial problems (Crone & Dahl, 2012; Dahl & Gunnar, 2009). Below, the findings of the different research aims will be summarized and discussed.

### ***Level and development of psychosocial problems in children with and without DLD***

The first aim was to compare the level and development of different psychosocial problems of children between 8 and 16 years old with and without DLD. Overall, we found higher levels of psychosocial problems in children with DLD compared to their peers without DLD. More specifically, we found more social problems in children with DLD such as higher levels of victimization (Chapter 2) and lower friendship quality (Chapter 3) compared to children without DLD. These social problems decreased as children became older at the same rate in children with and without DLD.

Internalizing problems were also higher in children with DLD compared to children without DLD. This was the case for social anxiety, somatic complaints (Chapter 4), and depressive symptoms (Chapter 5). The level of these three internalizing problems decreased in children with DLD as they became older. In children without DLD, social anxiety also decreased, whereas somatic complaints increased and depressive symptoms remained similar across time. However, much individual variation was found in both groups.

The level of externalizing problems of children with DLD compared to children without DLD provided mixed results. Externalizing problems include proactive behaviors such as intentional aggressive or manipulative behaviors, which children can use to gain something from others, such as social status (Crick & Dodge, 1996). These proactive externalizing problems were not elevated in children with DLD. Children with DLD did not report more proactive aggression (Chapter 6), nor did they report more bullying behavior than their peers without DLD (Chapter 2). Externalizing problems can also be reactive in nature. After perceived provocation or goal-thwarting, children can react aggressively to vent their anger or to get back at someone. However, children may also react in non-aggressive manners, such as with anger out-bursts or through oppositional behavior (Crick & Dodge, 1996). Children with DLD did not report higher levels of reactive aggression compared to children without DLD (Chapter 6), but the parents of children with DLD did report higher levels of Oppositional Deviant Disorder (ODD) symptoms, that is non-aggressive reactive externalizing problems (Chapter 6). The level of the different proactive and reactive externalizing problems decreased as children became older in children with and without DLD.

In the current project, we focussed on the different psychosocial problems of children with DLD to gain better understanding of specific problems children do and do not experience.

Our results mirror previous findings, where the mean level of psychosocial problems of children with DLD were generally elevated compared to children without DLD (Durkin & Conti-Ramsden, 2010; Yew & O'Kearney, 2013). The social and internalizing problems of children with DLD were consistently higher compared to children without DLD, whereas of the externalizing problems only the reactive non-aggressive problems, as reported by parents, were elevated. Please note that the children with DLD in our study were diagnosed at an early age. Therefore, they received extra support and special interventions from an early age. For instance, they received speech and language therapy and attended special education, or received specialised support within their mainstream schools. In spite of these special interventions, children still developed more psychosocial problems than children without DLD. However, these interventions may have prevented the development of more severe psychosocial problems. When DLD is not recognized, this may sharply increase the risks for psychosocial problems, including proactive and reactive externalizing problems (Cohen et al., 1998; Winstanley et al., 2018). A recent review found that 80 percent of the children with severe psychosocial problems, also had significant language problems. However, these language problems went unnoticed (Hollo, Wehby, Oliver, 2014). The negative impact of language problems on the development of problems in emotional competence and related psychosocial problems may in these cases be more severe.

The different psychosocial problems were most salient in younger children, whereas the level of psychosocial problems decreased in children with DLD as they became older. However, just as in previous studies, there was much individual variation (Beitchman et al., 1996; Conti-Ramsden et al., 2018). These findings suggest that children with DLD are at risk for the development of psychosocial problems. However, a simple explanation where DLD directly causes psychosocial problems, does not account for the variation within the group of children with DLD (Hart, Fujiki, Brinton, & Hart, 2004). Therefore, it is important to examine factors contributing to the development of psychosocial problems in individual children, such as their emotional competence.

### ***Emotional competence in children with and without DLD.***

The second aim was to examine the level and development of emotional competence in children with and without DLD. We examined whether children were able to recognise and understand their own and others' emotions and whether children were able to regulate and communicate their emotions.

As expected, we found that children with DLD had more problems with emotional competence, but only in the more complex elements of emotional competence. Children with DLD did not report more difficulties understanding the causes of their own basic emotions (Chapter 2 and 4), and they were less aware of the bodily symptoms of their emotions which is often found to be more adaptive (Chapter 4). However, children with DLD reported higher levels of anger, sadness, and fear (Chapter 2). Children with and without DLD reported similar

levels of approach emotion regulation strategies (solving a problem or asking social-support), whereas children with DLD reported more cognitive avoiding strategies (distracting oneself or trivializing a problem). No differences were found between children with and without DLD in maladaptive emotion regulation strategies such as worrying about a problem or externalizing behavior to vent anger (Chapter 4) and their parents reported that they had similar anger dysregulation problems (Chapter 6). Parents reported that children with DLD had more difficulties distinguishing and communicating about their own emotions (Chapter 4 and 6). As children with and without DLD became older their emotional competence improved. Older children in both groups reported higher levels of emotion understanding, more approach emotion regulation strategies, lower levels of worry, and their parents reported lower levels of anger dysregulation. Children with DLD also reported decreasing levels of anger, sadness, and fear as they became older, whereas emotion communication problems were unrelated to children's age in both groups.

In relation to others' emotions, more difficulties were found. Children with DLD reported similar abilities to feel the emotions of others (affective empathy; Chapter 3), but parents reported that they had more difficulties in recognising the emotions of others than children without DLD (Chapter 6). Additionally, the ability to understand the causes of the emotions of others (cognitive empathy) and the motivation to act prosocial in reaction to the emotions of others was lower in children with DLD compared to children without DLD (Chapter 3). As children with and without DLD became older, emotion recognition, affective empathy, cognitive empathy, and prosocial motivation increased.

Overall, these findings suggest that children with DLD develop their emotional competence, but experience marked difficulties regulating and communicating their emotions and understanding and acting on the emotions of others. Higher levels of negative emotions were present, although children with DLD did use similar emotion regulation strategies as children without DLD. This may reflect that the strategies used are less effective for children with DLD. For instance, in order to effectively solve an argument with a friend, children need to understand the intention of the friend, choose a good strategy to reach mutual agreement and communicate this adaptively. When children lack these important emotional, social, and communicative competencies, their problem-solving attempt will be less effective and not result in lower levels of negative emotions. Alternatively, the emotion regulation strategies of children with DLD may also be less effective if they do not fit the situation. Some situations are beyond a child's control. In those cases, avoidant strategies are more effective to regulate negative affect. However, when a problem can be solved, it may be less effective on the long run to avoid the situation resulting in more negative affect (Joormann & Stanton 2016). Finally, the higher levels of negative affect of children with DLD may also be the result of more negative experiences, due to miscommunication and social difficulties, which problems may not be easily solved. Therefore, children with DLD may have more negative emotions to begin with, which makes it difficult to regulate their emotions to acceptable levels.

Children with DLD also experienced difficulties understanding and responding to the emotions of others. These findings are in line with previous studies, which show a delay in perspective taking abilities and lower levels of prosocial behavior in children with DLD compared to their peers without DLD (Bakopoulou & Dockrell, 2016; Conti-Ramsden et al., 2018; Nilsson & Jensen de López, 2016). Although the understanding of other's emotions was problematic in children with DLD, the understanding of their own emotions was similar to their peers without DLD. However, we only measured the understanding of basic emotions, which typically develops before the age of 4 (Pons, Harris & De Rosnay, 2004; Westby & Robinson, 2014). Therefore, more complex or subtle emotion understanding abilities may still be problematic in children with DLD.

Importantly, the level of emotional competence increased as children with and without DLD became older. Children reported increasing levels of emotion understanding of their own and other's emotions as they became older, as well as better emotion regulation which reflects the ongoing development of emotional competence during (early) adolescence. The first years of life are important to gain basic emotional competencies, but during childhood and adolescence children have to develop more sophisticated skills in an increasingly more complex social world (Hughes, 2016; Pons, Harris & De Rosnay, 2004). During (early) adolescence, children spend much time with their peer group (Hartup & Stevens, 1999). Interactions with peers potentially provide many learning opportunities to gain insight in one's own and other's emotions and emotion communication (Eisenberg et al., 2006; Schaffer, 2005). This was confirmed in Chapter 3, in which we not only examined the extent to which empathy contributed to the prediction of friendship quality, but also the extent to which friendship quality contributed to the prediction of empathy development in turn. We found that positive friendship features had a positive impact on the development of affective empathy, cognitive empathy, and prosocial motivation. Although children with DLD had lower levels of cognitive empathy and prosocial motivation at baseline, the positive effect of friendship quality was similar in children with and without DLD. These findings suggest that positive interactions with peers enable children to gain better emotional competence as they become older. This outcome is in line with previous studies in children without DLD, which showed that children with reciprocated friendships gained better emotional competence as they became older (Von Salisch, 2018; Von Salisch, Zeman, Luepschen, & Kanevski, 2014).

In summary, our findings suggest that the development of emotional competence is delayed in children with DLD, but that children with DLD can develop their emotional competence when they have more positive learning opportunities. The development of emotional competence can, in turn, help children to improve their social relations and diminish internalizing and externalizing problems, which will be discussed below.



### ***The relation between emotional competence and psychosocial problems across time***

The third aim of this project was to explain individual differences in psychosocial problems of children with and without DLD. We examined the extent to which the level and development of emotional competence related to decreasing levels of psychosocial problems across time. Additionally, we examined whether these longitudinal relations were moderated by DLD.

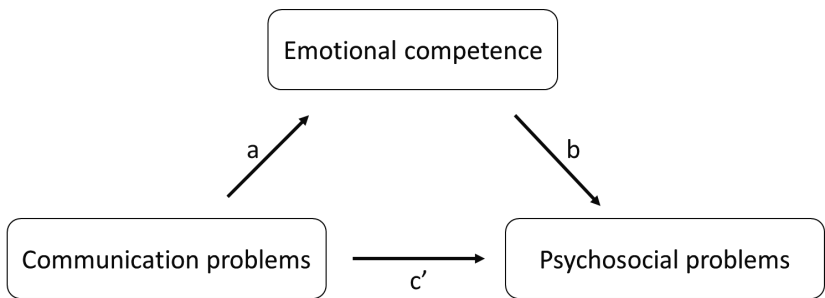
In the different chapters, we consistently found that emotional competence contributed to the prediction of the different psychosocial problems in children with and without DLD. Children with higher levels of emotional competence experienced less psychosocial problems. Specifically, better emotion understanding was related to lower levels of victimization, bullying behavior (Chapter 2), social anxiety, and somatic complaints (Chapter 4). Lower awareness of the bodily symptoms of emotions (reflecting an outward focus on the causes of emotions) related to lower levels of social anxiety and somatic complaints (Chapter 4). Emotion dysregulation was related to more victimization, bullying (Chapter 2), and reactive externalizing problems (Chapter 6). More adaptive emotion regulation strategies were related to lower levels of depressive symptoms, whereas maladaptive strategies were related to more depressive symptoms (Chapter 5). Fewer problems with emotion communication were related to lower levels of somatic complaints, ODD symptoms, and proactive aggression in both groups and in children with DLD also to lower levels of reactive aggression (Chapter 6). Finally, empathy was related to more friendship quality (Chapter 3) and better emotion recognition in others related to lower levels of reactive externalizing problems (Chapter 6).

Moreover, in most studies we also found that increases in the level of emotional competence of a child across time related to decreasing levels of psychosocial problems. Increasing levels of emotion understanding across time related to decreasing levels of bullying (Chapter 2), social anxiety and somatic complaints (Chapter 4). Decreasing awareness of bodily symptoms across time related to decreasing social anxiety, but only in children with DLD (Chapter 4). Decreasing levels of sadness and fear across time were related to decreasing victimization, while decreases in anger across time were related to decreasing bullying (Chapter 2). Decreasing anger dysregulation problems across time were related to decreasing ODD symptoms, and in children with DLD also to decreasing reactive aggression (Chapter 6). Increases in cognitive avoidant emotion regulation strategies and decreases of worrying across time were related to decreasing depressive symptoms (Chapter 4). Increases in emotion recognition across time related to decreasing ODD symptoms and in children with DLD to decreasing reactive aggression (Chapter 6). Finally, increasing levels of affective empathy, cognitive empathy and prosocial motivation across time within children related to increasing positive friendship features (Chapter 3). These findings reflect the positive effect of growth in emotional competence in diminishing psychosocial problems in children and adolescents with and without DLD.

The positive effect of emotional competence protecting against psychosocial problems may be stronger in children with DLD than in children without DLD. As described above, some of the relations between emotional competence and psychosocial problems were only present in children with DLD. Additionally, some of the described relations were stronger in children with DLD compared to children without DLD. For instance, more emotion understanding was a stronger predictor for lower levels of victimization in children with DLD than in children without DLD (Chapter 2). More awareness of bodily symptoms of emotions was more strongly related to higher levels of somatic complaints in children with DLD compared to children without DLD (Chapter 4). Finally, anger dysregulation related more strongly to more ODD symptoms in children with DLD than in children without DLD. These findings indicate that emotional competence has a marked effect on the development of children with DLD, requiring special attention during their development. The practical implications of these findings will be discussed at the end of this chapter.

*Emotional competence as mediator*

The final aim of this research project was to examine the relative effect of the severity of children’s communication problems of children with DLD and their emotional competence on the level of psychosocial problems. We expected that the level of emotional competence would mediate the relations between the severity of the communication problems of children with DLD and their psychosocial problems (Figure 1). As described above, the indices for emotional competence were related to the level of psychosocial problems (relation *b* in Figure 1). Below we summarise the findings on the relations between the severity of communication problems with emotional competence (relation *a*) and with psychosocial problems (relation *c*), and with psychosocial problems after emotional competence was taken into account (relation *c'*). If the relation between the severity of communication problems and psychosocial problems diminishes when emotional competence is taken into account, this indicates the emotional competence serves as a mediator in the relation.



**Figure 1.** Emotional competence as a mediator of the relation between the severity of communication problems of children with DLD and their psychosocial problems.

We examined the extent to which the severity of the communication problems of children with DLD were related to their emotional competence. More speech problems related to less emotion understanding, and semantic and coherence problems were related to less emotion understanding and unawareness of bodily symptoms. Additionally, more pragmatic problems were related to more problems distinguishing and communicating about emotions (Chapter 4). Speech problems also related to more sadness, and semantic, coherence, and pragmatic problems related to more sadness and fear. All communication problems (speech, syntactic, semantic, coherence and pragmatic problems) were related to higher levels of anger (Chapter 2). However, the communication problems of children with DLD were unrelated to anger dysregulation as reported by the parents, although syntactic and pragmatic problems approached significance (Chapter 6). Additionally, children with more communication problems reported more maladaptive emotion regulation strategies. Semantic problems related to more worry and semantic and pragmatic problems related to more externalizing strategies. In contrast, the communication problems were unrelated to approach and avoidant emotion regulation strategies (Chapter 4). There were also no relations between communication problems and the three aspects of empathy (Chapter 3), whereas only pragmatic problems related to the recognition of other's emotions (Chapter 6).

*Communication, emotional competence, and social problems: a vicious circle*

Next, the mediating role of emotional competence in the relation between communication problems of children with DLD and their social problems will be described and discussed. The severity of the communication problems of children with DLD were related to more social problems. Children with DLD who had more problems in speech, semantics, coherence, or pragmatics reported more victimization and, with the exception of speech problems, also more bullying (Chapter 2). However, when the different communication problems were examined together, only pragmatic problems were related to victimization. Additionally, the relations between communication problems and bullying were not significant when victimization was controlled, suggesting that children with DLD who have more communication problems are more often victimized or are bully-victims, who are being victimized but also show bullying behavior. Speech, semantic, and pragmatic problems were also related to more negative friendship features. When examined separately, pragmatic and semantic problems were more strongly related to negative friendship features, but when the scales were combined, none of them reached significance. The severity of the communication problems was unrelated to positive friendship features (Chapter 3). Overall, the severity of language problems of children with DLD were related to their negative peer interactions; the pragmatic problems and in some studies also the semantic problems contributed to more negative peer relations.

Next, we examined whether emotional competence mediated the relation between the severity of the communication problems and negative social peer relations (victimization and

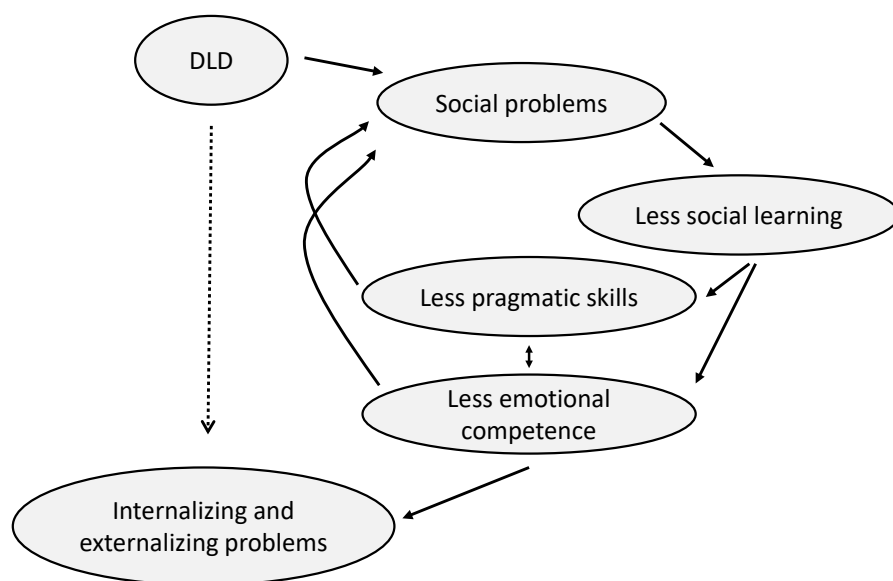
negative friendship features). However, no mediation was found. The severity of communication problems remained significant in addition to the emotional competence of children. Specifically, pragmatic problems remained related to more victimization in addition to emotion understanding and the level of negative emotions (Chapter 2). Speech, semantic, and pragmatic problems also remained related to negative friendship features in addition to empathy (which was unrelated to the severity of the communication problems; Chapter 3). Thus, these studies suggested that children with DLD who have more communication problems and/or more problems in emotional competence are at risk for negative social interactions with their peers.

In social interaction, children have to integrate different types of information to interact well with others. For instance, in order to react adaptively to a joke, a child first has to understand the linguistic information. Second, the child has to decide whether the comment was serious or not by taking the other's perspective, while combining this information with emotional information of the face, the tone of voice, the context and past experiences with the person. Third, the child has to decide whether the joke was fun or not, regulate their emotions and think of a good response. Finally, the child has to act out the response or verbally react. This is a complex interplay of different linguistic, pragmatic, cognitive and emotional competencies which enable children to understand social interactions and react adaptively.

Of the different communication problems, pragmatics and semantics were most salient for negative peer interactions. Possibly, these language areas are necessary to understand the intentions of others in social interactions. When children experience difficulties understanding the meaning of what others are saying, or experience problems understanding the meaning behind the words such as in jokes, figurative speech, or with sarcasm, they are more likely to misunderstand the intentions of others. Similarly, if children have difficulties recognizing and understanding others' emotions, that is when they do not correctly identify what others are feeling and why, they are also more likely to misinterpreted the intentions of others in social interactions (Crick & Dodge, 1996; De Castro, Merk, Koops, Veerman, & Bosch, 2005). Problems in intention understanding often create more hostile interpretations, which in turn causes more negative reactions to others (Crick & Dodge, 1992).

On top of these difficulties understanding the language, intentions and emotions of others, children may experience difficulties understanding and regulating their own emotions, which can further negatively affect social interactions between peers (Devine & Hughes, 2013; Eisenberg et al., 2005). Because children who are unable to regulate their emotions more often get into fights with their peers (De Castro et al., 2005; Rolfh, Holl, Kirsch, Krahé, & Elsner, 2018). Similarly, pragmatic problems make it more difficult to express the wishes and emotions in an adaptive manner, for instance to provide argumentation why a child wants something, and to build a story to convince others. Therefore, the combined effect of difficulties in (social) language and emotional competence may put children at risk of social problems.

In line with the proposed model in the introduction, we found in Chapter 3 that children who experience fewer positive interactions with their peers, had more difficulties developing their emotional competence, which in turn negatively affected their social relations. Similarly, pragmatic skills develop through social interaction with others (Bishop et al., 2017; Helland & Helland, 2017; Law, Rush, Clegg, Peters, & Roulstone, 2015; Norbury et al., 2014). As such, children who have difficulties understanding their peers (both their (social) language and their emotions) and experience problems expressing themselves in adaptive manners (also both through language and through adaptive emotion regulation and expression) can get stuck in a vicious circle where they have fewer positive social interactions, gain less sophisticated pragmatic skills and emotional competencies and therefore, experience more social problems. On the basis of these findings, we adapted the proposed model of reduced social learning in children with DLD (Figure 2). The model now reflects that both emotional competence and pragmatic language skills develop through social learning and, at the same time, are a prerequisite for positive social interactions. In addition, problems in emotional competence are a risk factor for the development of internalizing and externalizing problems, which will be discussed below.



**Figure 2.** Reduced social learning model in children with DLD

*Emotional competence as a mediator between communicative problems and internalizing and externalizing problems*

Next, the mediating role of emotional competence in the relation between the severity of communication problems of children with DLD and their internalizing and externalizing

problems will be summarized and discussed. There were fewer relationships between the children's communication problems and the different internalizing and externalizing problems of children with DLD than with their social problems. Semantic problems were related to more depressive symptoms (Chapter 5), speech and pragmatic problems were related to more social anxiety, whereas the severity of the communication problems was unrelated to somatic complaints (Chapter 4). Additionally, more coherence and pragmatic problems related to more ODD symptoms and more semantic and pragmatic problems related to more reactive aggression, whereas the communication problems were unrelated to proactive aggression (Chapter 6). The relations between communication problems and internalizing or externalizing problems were inconsistent. However, when relations were present, these most often were with the children's semantic or pragmatic problems.

Emotional competence mediated the relations between children's communication problems and their internalizing and externalizing problems. Specifically, the relation between children's communication problems and social anxiety was mediated by emotion understanding and bodily unawareness of emotions (Chapter 4). The relation between semantic problems and depressive symptoms in children with DLD was mediated by maladaptive emotion regulation strategies (Chapter 5). And the relation between pragmatic communication problems and ODD symptoms was mediated by emotion recognition in both groups, and by anger dysregulation in children with DLD. However, semantic problems remained related to reactive aggression in addition to anger dysregulation (Chapter 6).

Taken together, these studies create a picture that children with more communication problems are at risk for the development of problems in emotional competence which, in turn, puts them at risk for the development of internalizing and externalizing problems (Figure 2). This mediating role of emotional competence provides further support for the theory that emotional competence is a key factor in the psychosocial development of children with DLD, which is in need of specific interventions in addition to (social) language interventions. Implications of these findings are discussed below.

### ***Practical implications***

Language is a means to an end, not an end in itself. When a child has difficulties using and developing language, support is needed for the primary problem: their language development. However, we should not forget that language is not the end in itself. We have to ask ourselves what the child is missing because of the language problems and also provide support in those developmental areas to help the child gain the necessary knowledge, skills and social relations. Because of the language problems, children may gain less (social) knowledge from their environment, experience difficulties understanding their own and other's thoughts, intentions, and emotions and experience difficulties regulating and communicating their wishes and emotions in adaptive manners. Additionally, the language problems diminish chances to learn how to understand and use language in social interactions: pragmatics. These secondary

problems in emotional and communicative competence also need special attention from an early age on in order to diminish the negative effects of the language disorder and to prevent the development of psychosocial problems. Therefore, in addition to standard language tests, difficulties in pragmatics, emotional competence and associated psychosocial problems should be part of the standard examination of children with DLD, so that we can tailor interventions to individual needs of children.

Importantly, also when the language problems of a child have decreased, these secondary problems still may need extra support. Because DLD is a developmental disorder, the severity of language problems and the degree of functional effects of these language problems may differ in different ages and contexts (Dockrell, Lindsay, Roulstone, Law, 2014). When language problems have become less salient, this does not automatically imply that the secondary problems have also decreased, because during the time that children experienced language problems, children gained less knowledge, skills and competencies, which may continue to affect their development. In this way, the problems in emotional competence may start to overshadow the language problems of children. An important implication of the current research project is that the diagnosis, and thus the right for extra support by governments, should not be primarily based on children's language abilities, especially when children are older.

The DSM-5 states that children are eligible for a diagnosis of language impairment when they have significant language problems which affect their functioning in daily life and which are not better explained by other disorders or intellectual disability (APA, 2013). However, the effects of the disorder across time on the development of a child are not taken into account. When children no longer fall within the clinical spectrum of language impairment, children can lose their right for support. In the Netherlands, a therapist can argue that a child still experiences problems because of the DLD and therefore should still receive extra support. However, there are no objective standards which indicate when a child is still eligible for support on the basis of social-emotional problems, as these problems are not seen as part of the diagnosis. When we only judge whether a child has DLD by their language problems, we act as if language is the goal in itself. If we think of language as the means to an end and consider the development of children with DLD across time, it follows that the effects of DLD on emotional competence and related psychosocial problems should be part of the diagnosis.

How can we support children with DLD and strengthen their social-emotional development? Children with DLD need better access to the social experiences in which children learn emotional competence. Conversations about emotions often involve implicit knowledge. We expect children to have understanding of the (emotion) words we are using, about causes of the emotions and about socially acceptable ways to express emotions or react to other's emotions. When children do not have the same access to this knowledge, they will have difficulty to use emotions adaptively in social interactions. Therefore, we have to help children by making the implicit knowledge explicit. For instance, my daughter (5 years old) said that

she was feeling nervous when she went to bed, an emotion I could not place at that moment. Therefore, I asked her to explain why she felt nervous and whether she actually knew what the word meant. It appeared that she was trying out the word. She had picked it up somewhere in a conversation, but did not fully understand its meaning. Because of her use of the emotion word, I was able to explain the meaning and give examples of situations where you might feel nervous. She went to bed a little wiser. This example illustrates the many ways children with DLD may miss opportunities to learn about emotions. When children have less access to conversations of other people, they have less access to this incidental learning where they pick up a new word. When they do not communicate about their emotions, they receive less feedback and knowledge about these emotions by people around them. Additionally, they receive less knowledge when they have difficulty understanding the explanations of others, or when caregivers do not elaborate on the explanation because they are scared a child will not be able to understand.

There is a growing body of intervention studies that show that we can support children without DLD to further develop their emotional competence. Interventions can improve the emotion socialization behaviors of parents and thereby improving children's emotion knowledge and decreasing their psychosocial problems (Havighurst, Wilson, Harley, Prior, & Kehoe, 2010). Additionally, when children are actively involved in conversations about people's thoughts, emotions and corresponding behavior, they show improvements in their emotion understanding and mentalizing skills (Biancoa, Lecce, & Banerjee, 2015; Ensor, Devine, Marks, & Hughes, 2014; Lecce, Bianco, Devine, Hughes, & Banerjee, 2014; Ornaghi, Brockmeier, & Grazzani, 2014). These conversations can be between a child and a caregiver (Dunn et al., 1991; Ensor et al., 2014) or between children (Brown & Dunn, 1995; Ornaghi et al., 2014). However, the content of these conversations is important. When children become aware that people can have certain thoughts and emotions, they do not automatically also interpret others' thoughts and emotions accurately (Bianco et al., 2016). Therefore, caregivers should not only label emotions, but explain causes and consequences in social interactions (Bianco et al., 2006; Clements, Rustin, & McCallum, 2000; Melot & Angeard, 2003; Yuill & Little, 2018), because the understanding of the causes and consequences of emotions provides the necessary knowledge to solve a problem, deal with a problem or to adaptively respond to the emotions of others (Eisenberg et al., 2006; Gross, 1998; 2015).

If we want to make knowledge about emotions accessible for children with DLD, it is important to label emotions, but also elaborate on thoughts, emotions and the consequences in behavior. Because children with DLD initiate less conversations (Conti-Ramsden, Hutcheson, Grove, 1995), it is more difficult to engage a child in conversations about their emotions. However, by labelling and explaining emotions of the child and of others in real life situations, children gain access to the knowledge and skills they need to understand and communicate about emotions (Brinton & Fujiki, 1999). These conversations should be in accessible language so that children with DLD are able to follow and add to the conversations. However, by making the language accessible, we should not overcompensate and only talk about simple, basic, or



concrete subjects, as has been noted in the conversations with children with DLD (Conti-Ramsden, 1990; Hammer, Tomblin, Zhang, & Weiss, 2001; Yuill & Little, 2018). In contrast, we have to discuss, elaborate, and give nuances (Brinton & Fujiki, 1999; Yuill & Little, 2018). When we let the language problems of children with DLD simplify the content of our conversations, this may withhold children to develop their emotional competence, as is illustrated in this quote of a young woman with DLD:

*“I used to think that you can be happy, or mad, or sad. I didn’t know that you can be a little bit angry, or that you can be neutral or calm, because everyone always said: Are you angry or are you happy? You have to tell children with DLD that there are other emotions and how strong they are.”* (translated from Dutch; Van den Bedem, 2018)

If we do not provide children with DLD with the same level of emotion lexicon, explanation and nuance, we cannot expect them to develop their emotional competence to the same extent as children without DLD. Therefore, parents and professionals should be aware of their own language input and make sure that they do not oversimplify their message.

Related to this issue is the complexity of the visual material we use to help children with DLD communicate about emotions. By using visual material, we can help facilitate conversations about emotional situations. However, simple visualisations of emotions such as emoticons, or pictures with stereotypical, strong emotional expressions, may lack the necessary ecological validity to help children in real life situations. In real life, emotion expressions are often subtle, quick and part of a complex social interaction (Keltner & Ekman, 2003). If we use photos with more subtle emotion expression in real life situations, or video material of social interactions, we can discuss the emotions, interpretations and behaviors of children involved in the situations in real life contexts. It may be especially effective to use video material of children themselves so that children are able to describe their own interpretations and emotions in a situation and afterwards think of the interpretations of other people involved. Moreover, videos can help to see how a child reacted, how others reacted on the child and whether this was the anticipated or desired reaction (Kern et al., 1995). This can help the child to gain insight in emotional situations, alternative interpretations of a situation and the consequences of their emotion expression.

Another important area where we can help children with DLD, is by helping them gain positive social relations through which they can improve their emotional competence, as well as pragmatic and social skills. Especially through interactions with peers, children have to learn to adept their language, emotion expressions and behavior to others, and experience what does and does not work, so they can use this knowledge in future interactions (Schaffer, 2005). Positive social interactions may be found through school, through social activities, in contact with siblings (Knott, Lewis, & Williams, 2007), or with children who also experience communication problems. Contact with peers with similar problems may be especially helpful

for children to gain confidence in social interactions and learn new communicative, emotional, and social skills which they can use in other social contexts (Isarin, 2013; Myers, Davies-Jones, Chiat, Joffe, & Botting, 2011).

As with all children, children with DLD need support from adults in order to gain the necessary competencies to be able to develop positive interactions with their peers (Schaffer, 2005). In young children, parents often are present while children play and help children express their own wishes, understand each other, take each other's perspective into consideration and solve conflicts. In older children, we increasingly expect children to do this independently. However, when children are less emotionally competent, they still may need help to develop these important skills. It seems crucial for parents and professionals working with children with DLD to be aware of problems in emotional competence and help children where necessary to develop insight in themselves and others and adaptive emotional reactions. Group based interventions may provide important opportunities to improve the communicative and emotional competence of children with DLD. In semi structured social interactions, such as playing a game together, professionals can facilitate the interactions between children. Video interaction guidance has been found effective to help professionals facilitate interactions between children (Jilink, Fukink, & Huijbregts, 2018), so that children are able to practise and develop these important life skills in real life situations.

### ***Limitations and future studies***

The current project mainly used self-report measures. The positive effect of self-report measures is that it provides insight in the subjective experiences of children and enabled us to examine what is going on insight a child's head. Other people may to a lesser extent pick up on these internal processes or internalizing problems than children themselves (Lambie & Marcel, 2002). However, children may also over- or underestimate their own abilities or behaviors. Previous studies who did use a child and parent-report to examine the same variable, found that children and adolescents with DLD reported similar levels as their parents (Brownlie et al., 2004; St. Clair et al., 2011). This strengthens our idea that children with DLD are able to use self-report measures reliably, just as children without DLD. Even so, in future studies it would be good to use multiple measures of the same construct to be able to compare the perspective of different people and to provide information about the context that children with DLD do or do not experience certain difficulties such as in school compared to at home (Lindsay, Dockrell, & Strand, 2007).

Additionally, to further improve the measures on emotional competence, it would be good to examine children's understanding, regulating and expression of emotions in specific situations. When we are not specific about the type of situations in the questionnaires, we do not know whether children think of situations with clear or diffuse causes of emotions, strong or subtle emotions, and whether situations are changeable or not. Differentiating these

emotional situations will provide further insight into the extent to which children are able to use their emotions adaptively in diverse situations.

In order to measure the severity of the general communication and pragmatic problems, we used the Child's communication Checklist (CCC-2). Recently, the importance has been stressed of differentiating between linguistically related versus socially related pragmatic problems, which is not possible with the CCC-2 (Andrés-Roqueta & Katsos, 2017). Linguistic-pragmatic problems are strongly related to children's structural language problems. When children for instance provide too little information for others to understand a story, this may be related to their productive language problems: they have too little words available and experience problems combining words to formulate a message. However, children may also provide too little information, because they misjudge what others already know. In this case, it would reflect more social-pragmatic problems, which is related to the ability of children to take the perspective of someone else (Theory of Mind [ToM]; Andrés-Roqueta & Katsos, 2017; Wimmer & Perner, 1983).

It is likely that social-pragmatic skills are more difficult to learn for children with DLD as the development of ToM is dependent on social learning (Hughes & Leekam, 2014; Rieffe et al., 2016; Schaffer, 2005). Moreover, similar cognitive processes are at play in the development of social-pragmatic problems and emotional competence. For instance, in order to be able to understand others feelings, children have to understand that their own and others feelings may differ and take the perspective of the other child. Future studies should differentiate the linguistic- and social-pragmatic problems to gain better understanding of the pragmatic problems of children with DLD, the development of both pragmatic areas and their relative contribution to social problems in children with DLD in addition to children's emotional competence.

The CCC-2 is especially appropriate in clinical groups, whereas only the pragmatic and general communication problems score are reliable in children without DLD (Geurts et al., 2008). In children without DLD, the severity of the communication problems was often unrelated to their psychosocial problems. However, previous studies in children without DLD did find relations between the severity of communication problems and psychosocial problems, although mostly in younger age groups (Salmon, O'Kearney, Reese, & Fortune, 2016). Possibly, the CCC-2 was not sensitive enough to measure the communication problems in children without DLD. Alternatively, it could also be that in the age range of our study the relations between communication problems and psychosocial problems have become less strong. A recent review found decreasing strengths in the relation between language problems and social problems in children without DLD (Van der Wilt, Van der Veen, Van Kruistum, & Van Oers, 2019). It would be interesting to examine in future studies whether a similar process is at work in children without DLD as in children with DLD, in which pragmatic problems and problems in emotional competence start to overshadow initial language problems in relation to psychosocial problems. In children where language problems are unrecognised, it is especially

likely that language problems may cause problems in emotional competence. These problems in emotional competence and their effects on these children's behaviors may become the focus of interventions, whereas underlying problems in language remain unnoticed (Cohen et al., 1998; Hollo, Wehby, Oliver, 2014).

In the current project, we examined a large number of areas of the social-emotional development of children with and without DLD. We focussed on emotional competence as an explanatory factor, because of the importance of language in the development of emotional competence. Another area which is highly dependent on the language development of children is executive functioning (EF). EF refers to the cognitive control one can assert to thoughts, emotions, and behaviors. Examples of EF are impulse inhibition, switching between tasks, and working memory, where people can think about their experiences and plan their actions, while using knowledge from past experiences. The development of EF is closely related to children's language development (Botting et al., 2017) and children with DLD often experience problems with EF (Visser, Koolen, Hermans, Scheper, & Knoors, 2015). EF also plays an important role in emotional competence and in turn the development of psychosocial problems (McClelland, Cameron, Wanless, & Murray, 2007). It would be interesting to further examine the emotional competence problems of children with DLD and examine whether problems in EF, or lack of social and emotional knowledge, are at the basis of problems in emotional competence. For instance, in order to adaptively react in an emotional situation, children have to inhibit their first impulses, think about possible actions to help them reach their goal, while using knowledge of past experiences in their working memory (Crick & Dodge, 1996; Gross, 2015). It could be that children experience problems regulating emotions because they are less able to withhold their first impulses, or that they have difficulty ordering their thoughts and planning their actions in their working memory. Alternatively, it could be that children lack knowledge of the consequences of their emotional displays or have incorrect expectations of the consequences of their behaviors, because of a lack of insight in other's emotions.

### ***In conclusion***

The language problems of children with DLD impede their opportunities to interact with and learn from their social environment, which often results in lower or impaired emotional competence. Problems in emotional competence have a marked effect on the development of psychosocial problems of children with DLD, which even overshadows the severity of their communication difficulties. However, when children have more emotional competence or develop their emotional competence as they become older, these psychosocial problems are likely to decrease. Positive social interactions with peers enable children with and without DLD to improve their emotional competence. Therefore, parents and professionals should be aware of the difficulties in emotional competence children with DLD and recognize how these problems may affect their behavior. It is important to acknowledge that children with (a history of) DLD who have missed opportunities to learn early in life, may continue to experience

problems later on, or again experience problems when the communicative and social demands of the environment change. Parents and professionals should help children with DLD to gain insight in their own and other's emotions and adaptive emotion communication by providing explanations, elaborations and nuances in the context of emotional experiences. Finally, children with DLD need help to find and keep likeminded friends with whom they are able to further improve these important life skills.

Do you have tips for other children with DLD?

"Just be yourself and keep at it. Then you have more confidence and often succeed. Then you have the feeling, the feeling I can do something."

"First try to tell the friends you know well about DLD and then maybe later to others. Just take it easy."

"Dare to overcome the shyness and then really try. First a bit easy and then more difficult."

How can we help children with DLD?

"The teacher sometimes has to show something, not always just talk about it."

"Ask questions about how they feel in certain situations. To someone who finds it difficult to talk."