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Preschool predictors of social competence in first grade. A prospective community study

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Preface

Previous to writing my master thesis, I conducted my Bachelor based on data collected from the Trondheim Early Secure Study. I found the concept and possibilities this broad longitudinal study and data collection enabled to be intriguing, and when deciding on a master thesis my wish was to continue researching based on the same data base. Since writing my Bachelor, based on data from children of 4 years of age, the Trondheim Early Secure Study has continued gathered data from the same children two years later, opening for the possibility to conduct research with predictions. My interest in child development made writing about preschool predictors of social competence seem like a natural choice, which I do not regret.

I would like to thank førsteamanuensis Øyvind Kvello, my supervisor, for feedback and positive encouragement. Many thanks to Professor Lars Wichstrøm, for permission to accessing the data base, showing great patience while giving me insight into research models and statistical methods and for challenging me to do better. I would also like to thank Kyrre Svarva for help with statistical analyses in SPSS and Mattis Himo for inspiring conversations over several cups of coffee. I would also like to thank my fiance for showing great emotional support, encouragement, proofreading and great patience during the last year, and especially the last months.

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Abstract

Background: Developing a well-adept social competence in preschool years is considered important and seems to play a pivotal role in later social functioning like school readiness and academic competence. Due to the individual development in children, establishing potential early markers of early social problems has been difficult. Although parent, peer, and contextual factors may be important to children's development of social competence, the present study addressed the range of individual differences in children that may facilitate or impede social skills development. **Method:** The paper is based on data from the comprehensive longitudinal Trondheim Early Secure Study (TESS) of a screen-stratified community sample of 2475 children who were assessed at 4 year of age (T1) and followed up at the age of 6 (T2) (n=797). General linear modeling weighting data back to yield true population estimates of the predictive value of Social Competence, Gender, Negative Affectivity, Surgency, Effortful Control, Inattention, Hyperactivity, Impulsivity, Peer Problems, Disorganized Attachment and Callous-Unemotional traits assessed at T1 in predicting Social Competence at T2, when adjusting for Social Competence at T1. **Results:** Analysis indicates that Social Competence, Surgency, Inattention, Peer Problems high levels of Callous-Unemotional traits and Disorganization were unique predictors of Social Competence when adjusting for all variables. Negative Affectivity failed to predict Social Competence. **Conclusions:** Beyond a sizable continuity in social competence a range of child characteristics may enhance social skills development in young children**.** The identification of such child factors, when controlling for other potential factors, may inform health promotion efforts towards increasing young children's social competence.

Key words: Social competence, surgency, negative affectivity, effortful control, impulsivity, inattention, hyperactivity, peer problems, disorganized attachment, callous unemotional traits.

Abstrakt

Bakgrunn: Utviklingen av en velfungerende sosial kompetanse i førskolealder er ansett som en avgjørende utviklingsoppgave og synes å spille en vesentlig rolle for senere sosial fungering, skoletilpasning og akademisk kompetanse. På grunn av barns individuelle utvikling, kan etableringen av potensielle tidlige markører for sosiale problemer være vanskelig å avdekke. Selv om foreldre, jevnaldrende og kontekstuelle faktorer kan være viktig for barns utvikling av sosial kompetanse, adresserte denne studien et omfang av individuelle forskjeller i barn som kan lette eller hindre utviklingen av sosial kompetanse. **Metode:** Denne avhandlingen er basert på data fra den omfattende longitudinelle Tidlig Trygg i Trondheim studien (TtiT/TESS) av et stratifisert utvalg av 2475 barn som ble vurdert ved 4 års alder (T1) og igjen for oppfølging i en alder av 6 (T2) (n = 797). Generelle lineære modeller vektet data slik at man oppnådde sanne bestandsestimater av prediktiv verdi av Sosial Kompetanse, Kjønn, Negativ Affekt, Utadventhet (Surgency), Innsatsbasert Kontroll (Effortful Control), Uoppmerksomhet, Hyperaktivitet, Impulsivitet, Vennskapsproblemer, Disorganisert Tilknytning og Manglende Medfølelse (Callous Unemotional) vurdert til ved T1 å forutsi Sosial Kompetanse ved T2, når man justerer for Sosial Kompetanse ved T1. **Resultat:** Analysene indikerer at Sosial Kompetanse, Utadventhet, Uoppmerksomhet, Vennskapsproblemer, høye nivåer av Manglende Medfølelse og Disorganisering var unike prediktorer på Sosial Kompetanse når det ble justert for de andre variablene. Negativ Affekt predikerte ikke senere Sosial Kompetanse i dette utvalget. **Konklusjon:** Bak en tydelig kontinuitet i sosial kompetanse, er det en rekke trekk hos barn som kan forsterke utviklingen av sosial kompetanse hos små barn. Identifiseringen av slike faktorer, når man kontrollerer for flere potensielle påvirkbare faktorer i barnet, kan bidra til helsefremmende innsats mot å øke små barns sosiale kompetanse.

Nøkkelord: Sosial kompetanse, utadventhet, negative affekt, innsatsbasert kontroll, impulsivitet, uoppmerksomhet, hyperaktivitet, disorganisert tilknytning, manglende medfølelse.

Preschool predictors of social competence. A prospective community study

The importance acquiring social competence early in life has been thoroughly documented during the last decades (Denham et al., 2003; Henricsson & Rydell, 2006; Ladd, 1999; Lengua, Honorado & Bush, 2007; Pellegrini & Glickman, 1991; Waters & Sroufe, 1983), and there is a considerable increase in social skills such as sharing, turn-taking, prosocial behavior, and assertiveness during the preschool and early school age years (Hay, Payne & Chadwick, 2004; Rubin, Copland, Fox & Calkins, 1995).

During kindergarten years several developmental trajectories emerges, thus leading to changes in competencies, such as the ability to discern their own and others' emotional states (Denham et. al., 2006). The development of peer interaction skills is considered a competence hallmark in kindergartners (Bohlin, Hagekull & Rydell, 2000; Waters & Sroufe, 1983) and related to establishing healthy peer interactions (Denham et al., 2003) and therefore plays a critical role in both later peer relations and the development of social competence (Williams, Ontai & Mastergeorge, 2006). Therefore children unable to obtain these competence hallmarks are considered disadvantageous, compared to peers with peer interaction skills contributing to increased social competence in preschool years. Nonetheless, there are substantial individual differences – differences which may have widespread effects on psychosocial adjustment (Hartup & Stevens, 1999; Kvello, 2006; Szewczyk-Sokolowski, Bost & Wainwright, 2005). Why do some children excel in acquiring social competence at an early age whereas other children fail to develop them or develop them at a slower pace? This is the principal question addressed in the present research.

Due to the importance of this question a large body of research has addressed potential predictors of change in social skills. Although a range of domains have been studied, such as parent (Keane & Calkins, 2004; McDowell & Parke, 2005; Schneider, Atkinson & Tardif, 2001), child (Rhoades, Greenberg & Domitrovich, 2009), and contextual (Lengua et al., 2007) factors, arguable the largest effort has been to disentangle various child factors that may promote or hinder the development of social competence.

Despite these efforts few definite conclusions have been reached, and the present inquiry will therefore conduct an in-depth scrutiny of such child factors in order to possibly further our understanding of the origins of individual differences in social competence. Existing child-focused research has identified several potentially etiological factors, including temperamental differences (Kochanska, Murray & Harlan, 2000; Rothbart, Ahadi & Evans, 2000; Sleddens, Kremers, De Vries. & Thijs, 2013), development of callous unemotionality (Barry, Barry, Deming & Lochman, 2008; Frick, Cornell, Barry, Bodin & Dane, 2002; Kochanska, 1993; Moffitt, 1993), attachment style (Carlson, 1998; van Ijzendoorn, Schuengel & Bakerman-Kranenburg, 1999; Lyons-Ruth, 1996; Shulman, Elicker & Sroufe, 1994), peer relations (Martin, Cole, Clausen, Logan & Strosher,

2003; Mathieson & Banerjee, 2010; Walker, 2005; Williams et. al., 2006), and early markers of ADHD, like impulsivity, hyperactivity and inattention (Olson, 1989; Spira & Fischel, 2005). However, several of these child factors are correlated, for example temperamental effortful control correlate with ADHD, and ADHD is related to victimization from peers, which in turn is related to increase in children's internalizing behaviors and rejection from peers (Hodges & Perry, 1999). Victimization from peers in kindergartners is also related to disliking and avoiding school (Kochenderfer & Ladd, 1996).

Due to the fluctuating nature of early development, establishing actual markers of later maladjustment in early childhood has been challenging. Yet, an understanding of early social competence is necessary as it is an important predictor for further development in other domains such as emotional competence (Denham et al., 2003), school readiness and academic competence (Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Trentacosta & Izard, 2007). Consequently a poorer development of social competence in early childhood will contribute to greater negative consequences for the child. Therefore a broad understanding of early child competence is necessary. Firstly it provide a possibility to understand the quality of child functions (Waters & Sroufe, 1983) in order to identify child risk characteristics that my lead to a poorer development that again may lead to negative interpersonal consequences (Elliott & Gresham, 1993; Keane & Calkins, 2004). Secondly, early detection of such risk factors should lead to early preventive measures and intervention, like social skills enhancement programs, that may contribute to a better social functioning (Elliott & Gresham, 1993).

The understanding of social competence in preschool-aged children is considered a relatively stable construct (Campbell, Lamb & Hwang, 2000; Henricsson & Rydell, 2006). Therefore, a focus on bridging the work on social competence during school years, with that from early infant and toddler years, has aimed to better understand the development of social difficulties and their origins at an early age, thus building a framework for preventive interventions (Campbell et. al., 2000).

With regards to young children, child temperament is considered a central factor in the development of children's personality, emotionality/affect and social behavior (Rothbart et. al., 2000) and temperamental traits such as negative affect, effortful control and surgency is therefore included in this analysis. Children with negative affect may be less likely to regulate their emotions in appropriate ways, and more likely to respond inappropriately during peer interactions, than are children who are temperamentally easy (Szewczyk-Sokolowki et. al., 2005). Effortful control in early childhood has been found to be longitudinally related to better emotion regulation, fewer externalizing problems, stronger conscience and a greater committed compliance later in childhood (Kochanska et. al., 2000). Children with high level of inhibitory control like effortful control is

therefore more likely to be rated higher in social skills (Rhoades et. al., 2009) and interactive play by practitioners (Mathieson & Banerjees (2010). Surgency has also been related to prosocial traits and improvements in social skills (He et. al., 2013) with less social withdrawal in children (Mathieson and Banerjee, 2010).

An important developmental objective in a child's life is the formation of an attachment bond to parents, caregivers and later peers (van Ijzendoorn et. al., 1999). Securely attached children are hypothesized to have acquired a working model of others which indicate that interaction with them is pleasurable, fairly predictable, and that others are benign. Hence, securely attached children should be hypothesized to have an interest in others and therefore also have an urge to acquire the necessary skills to interact with peers, parents and other adults. Indeed, research suggests that securely attached children are more socially competent (Shulman et. al., 1994) and have larger peer social support networks (Bost, Vaughn, Washington, Cielinski, & Bradbard, 1998) compared to children with an avoidant or resistant attachment history (Sroufe, 2005). Attachment was therefore included in the present model of social skills development through disorganized attachment as it it theorized to have a negative effect on the development of social competence.

Interaction patterns with peers become fairly stable by the early school years (Campbell et. al., 2000) and peer play in particular provides a critical learning context for developing social competence (LaFreniere & Sroufe, 1985; Mathieson & Banerjee, 2010). Peer status is seen as a pivotal part of defining social competence (McDowell & Parke, 2005) and successful peer relations are important for later measures of social, emotional and educational competence (Kvello, 2006). Social competence with peers is also seen as a relative stable construct from 2-15 years of age and may work as an indicator of social competence throughout childhood and adolescence (Campbell et. al., 2000; Williams et. al., 2006). Therefore optimal cooperation-skills with peers is a critical skill to acquire. The ability to negotiate with others during social conflicts is an essential component of the socialization process and is according to Green & Rechis (2006) best learned during the early years. Based on earlier empirical findings peer problems is therefore included in this analysis and theorized to have a negative effect on the development of social competence.

Peer relations plays a pivotal part of the development of social competence in kindergarten-aged children (McDowell & Parke, 2005) and securely attached children are found to be more socially competent with peers (e.g Shulman et. al., 1994). Based on these empirical findings the assumption of an interaction between peer problems and disorganization is included in the analyses and theorized to have a greater negative effect on social competence.

Few studies have been conducted on preschool aged childrens' impulsive, hyperactive and inattentive behavior, partly because of the difficulties in assigning diagnostic labels to young children based on behaviors that may be transient or simply reflect normative variations. In terms of

stability, research has shown that normal behavior in kindergarten is more stable than abnormal behavior (Spira & Fischel, 2005). Due to the fact that many children will outgrow these early symptoms of difficulties, diagnoses such as ADHD are relatively rare before school age (Lahey et. al., 1998). However it is possible that, for some children, early problem behaviors within the domains of impulsivity, hyperactivity and inattention are signs of dysfunction that can persist for years and considered to be early markers of ADHD (Spira & Fischel, 2005). Consequently, this analysis include impulsivity, hyperactivity and inattention in order to attempt to identify these traits' potential effects in early childhood.

The ability to manage behaviors and emotions in accordance with social expectations is an essential component of social competence, especially during early childhood as it has been shown to play an important role on school adjustment and kindergarten achievements (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003). Children with callous unemotional traits are hypothesized to have a unique motivational and affective style that make them less responsive to typical socialization practices (Kochanska, 1993) and places a child at higher risk for showing antisocial behavior (Wootton, Frick, Shelton & Silverthorn, 1997). Earlier research (e.g. Moffitt, 1993) has found callous unemotionality to be an essential trait in the pathway to childhood-onset conduct problems compared to adolescent-onset (Frick et. al., 2003). Callous unemotional traits are therefore included in this analysis and theorized to have a negative effect on social competence.

Although important contributions have been made, studies have almost exclusively addressed these potential predictors in isolation (Denham et. al., 2003; Szewczyk-Sokolowski et. al., 2005. Current research is therefore silent as to the relative importance of various child and peer factors. In the present research I therefore analyze the collective and unique contribution from a wide range of potential predictors of social competence in a large community sample of Norwegian preschoolers.

Based on the earlier empirical findings within the field, the traits included in this analysis are Negative Affectivity, Effortful Control, Surgency, Disorganized Attachment, Peer Problems, Impulsivity, Inattention and Hyperactivity and Callous Unemotional traits.

The study includes a complex analysis where each variable's unique effect on changes in Social Competence is identified, while adjusting for Social Competence at age 4 and Gender. By including all variables in one model, thus controlling for each other as potential confounding variables, a more accurate comprehension of the influential traits on social competence may be attained. This gives an opportunity to observe potential changes within each variable in order to understand how the complex development of social competence is being carried out.

In order to understand why the acquiring of social competence differ in early childhood the following study questions are examined;

a) How would the emotions Negative Affectivity, Surgency and Effortful Control affect changes in later Social Competence when controlling for other potential contributors?
b) Would controlling for Negative Affect, Surgency, Effortful Control, Callous Unemotional traits, Peer Problems, Inattention, Hyperactivity and Impulsivity affect Disorganized Attachment's negative effect on Social Competence?
c) Would the negative effect of Peer Problems on Social Competence be affected by other potential contributors?
d) How would early markers on ADHD (Impulsivity, Hyperactivity and Inattention) affect changes in later Social Competence when controlling for other potential contributors?
e) Would controlling for the other aforementioned potential contributors affect Callous Unemotional trait's negative effect on Social Competence?
f) Would an interaction between Disorganized Attachment and Peer Problems predict a greater negative outcome with regards to Social Competence scores at the age of 6?

Method

Participants

The data in the present study comes from the Trondheim Early Secure Study (Wichstrøm et. al., 2012). Of all children in Trondheim (with a population of 180 000) born in 2003 and 2004 who met at community well-child clinics (97% of all children), 2475 children had their parents' consent to be screened for emotional and behavior problems using Goodmans' (1997) Strength and Difficulties Questionnaires- SDQ, with an 82% consent rate. SDQ scores were divided into four strata: 0-4, 5-8, 9-11, and 12-40. Defined proportions of parents in each stratum (0.37, 0.48, 0.70, and 0.89, respectively) were invited to participate. Children at 4 years of age were predominantly in state-sponsored day care centers at initial assessment (T1) (95.0%) and all were attending school at follow-up (T2) approximately two year later at 6 years of age. The drop-out rate after consenting at the well-child clinic (T1) was unrelated to the SDQ, $t(1,250)=.28$, $p=.78$ or gender, Chi-sq.=0.23, df=1, $p=.37$. At T1 the mean age of the children was 53.0 months (SD=2.1). At T2 797 families were examined, of whom 41 did not participate at T1. Attrition from T1 to T2 was not selective according to any of the study variables except that teachers rated participating children slightly higher on social competence than non-participating ones (Means: 57.24, SD=12.43 vs. 53.35, SD=12.69; $t[851]=3.69$, $p< .001$). The mean age of the children was 4.4 years (SD=.18) at T1 and 6.7 years (SD=.25) at T2. At T1, the sample was composed of 50.9% girls and 49.1% boys, whereas two years later, the numbers were 49.9% and 50.1%, respectively. Approximately all children (95%) attended official day care centers at T1, whereas all were in school at T2.

Setting

In addition to the clinical interviews, the children and their parents were invited to the research clinic at The Norwegian University of Science and Technology (NTNU), Department of Psychology, Trondheim, to participate in testing and observation. One of the cognitive measures, Språk 4 [Language test for 4-year-olds], was conducted in the local community well-child clinic. All other instruments used in this study was conducted in the research clinic, including The Peabody Picture Vocabulary Test and The Manchester Child Attachment Story Task.

The population of Trondheim share several key indicator similarities compared to the national average, like identical employment rate and education levels. The average gross income per inhabitant is 99,5% of the national average and two-parent families account for 80% of the households compared to a national average of 81.4%. However the sample contained significantly more divorced parents (7.6%) than the population (2,1%) (For more information about the sample, see Wichstrøm et. al., 2012).

Instruments/measures

Social Competence. Social Competence, measured by kindergarten and teacher ratings from the Social Skills Rating System (SSRS) (Elliott & Gresham 1993), was obtained in preschool at age 4 (T1) and first grade at age 6 (T2). The SSRS teacher report measures four sub scales: 1) cooperation (behaviors such as helping others, sharing and complying with rules and directions), 2) assertiveness (initiating behaviors such as asking others for information, introducing oneself and responding to the action of others, such as peer pressure and insults), 3) responsibility (behaviors that demonstrate the ability to communicate with adults and regard for property or work) and 4) self-control (behavior that emerge in both conflict situations, such as responding appropriately to teasing, and non-conflict situations that require taking turns and compromising). The total score, which was a combination of the four sub scales, was used (Preschool: Cronbach's alpha $\alpha = .89$ and first grade: $\alpha = .93$). Since the raters of the SSRS-measure was both kindergarten employees, at T1, and school teachers, at T2, problems arising from shared rater variance should be minimized.

Negative Affectivity, Surgency and Effortful Control. A Norwegian translation of the Children's Behavior Questionnaire (CBQ) for children between 3 to7 years of age was used to assess temperament and were completed by the children's parents (Rothbart, Ahadi, Hershey & Fisher, 2001). The CBQ is based on the reactive and self-regulative model of temperament and is developed to provide a differential measure of child temperament (Rothbart et. al., 2001; Rothbart & Ahadi, 1994)**.**

The CBQ consist of 195 items which is divided into 16 scales (See Appendix??.) The current study employed the factor solution of the CBQ; the Big 3 (Rothbart et al., 2001) referring to 1) Negative

Affectivity (NA) based on the scales Anger, Discomfort, Fear, Sadness and Soothability (reversed) , 2) Surgency (SU) based on the scales Activity Level, High-Intensity Pleasure, Impulsivity and Shyness (reversed) and 3) Effortful Control based on the scales Attention Focusing, Attention Shifting, Inhibitory Control, Low Intensity Pleasure and Perceptual Sensitivity. In accordance with the originators the last two scales Smiling and Laughter and Positive Anticipation, originally loading on the surgency factor, were not included. Cronbach's Alpha on all items: $\alpha = .77$. Scales $\alpha = .57$ (Sadness) to $\alpha = .92$ (Shyness). Alpha values on each factor: NA $\alpha = .88$, SU $\alpha = .92$ and EC $\alpha = .84$.

Disorganization. Disorganized Attachment was measured with the Manchester Child Attachment Story Task (MCAST) (Green, Stanley, Smith & Goldwyn, 2000). Doll-play and story-stems are used to elicit attachment representations with a total of four attachment-related distress stories completed by the children. The administrator of the MCAST test establishes a story, including a child doll and either a mommy or daddy doll. Emphasizing the child's identification with the doll figure is necessary. The role- play stories begin with everyday events in which something bad/scary and stress inducing suddenly happens (e.g. the child doll is hurt/awakened by a nightmare etc.) designed to activate the child's attachment system. When the story reaches a climax the administrator facilitate the completion of the story by the child by asking the child to finish the story. The child is then asked to explain the feelings of both the child and parent dolls. The doll play was videotaped, and each attachment-related story was coded by trained and approved independent coders unaware of any information about the child. Rather than a categorical measure of the disorganization-variable it were measured in a dimensional basis because the meta-analysis evidence between the predictive value of categorical opposed to continuous attachment was non-significant (Schneider et. al., 2001). Continuous measurements increase statistical power, as could be seen in the case of the MCAST (Futh, O'Connor, Matias, Green & Scott, 2008), and therefore a continuous D-scale was composed, to increase variability and statistical power. The primary categorization was coded as 1 (present) or 0 (absent) in each of the four vignettes, whereas a secondary classification was coded as 0.5 (present) or 0 (absent). A D-scale was computed as the average score across the four vignettes for the primary and secondary scores (range 0-1). Hence, a child who attained a primary classification of D on two vignettes and a secondary classification of D on one vignette would be given a D score of $(1 + 0 + 1 + 0.5)/4 = .625$. Raters that were blind to all information concerning the child and family double coded a randomly selected 10% of the MCAST stories, resulting in an inter-rater reliability of ICC = 0.71 for the D-scale across multiple pairs of raters.

Peer Problems. To assess Peer Problems at age 4 the Norwegian translation of the peer problems subscale of the SDQ (Goodman & Goodman, 2009) was used. The five items were a) rather solitary, tends to play alone, b) has at least one good friend (reversed), c) generally liked by other children (reversed), d) picked on or bullied by other children and e) gets on better with adults than with other children (Goodman, 1997). Cronbachs alpha for the subscale $\alpha = .61$.

Inattention, Hyperactivity and Impulsivity. Blinded raters rated three sets of observed Inattention Hyperactivity and Impulsivity on a 100-point scale independent of each other in three situations; 1) parent-child play and task solving (e.g. the child has to clean up toys alone without help from parent, sitting still for 5 minutes in order to wait to get a price concealed in a bag placed in front of the child), 2) completion of emotionally toned play vignettes using a doll's house (i.e. the MCAST doll play), and 3) being interviewed about relationship towards parents, teachers and peers.

Callous Unemotional traits. A measure of Callous Unemotional traits (CU) was based on items from the Preschool Form of the Achenbach System of Empirically Based Assessment (ASEBA) based on the work of Willoughby, Waschbusch, Moore & Propper (2011). An open ended item for additional problems consisting of a) doesn't seem to feel guilty after misbehaving, b) punishment doesn't change behavior, c) seems unresponsive to affection, d) shows little affection toward people and e) shows too little fear of getting hurt. Cronbachs alpha for CU $\alpha = .69$.

Statistical analysis

General linear modeling was used to predict Social Competence at T2 while adjusting for social competence at T1. The sample was screen-stratified; therefore, analyses were conducted using the Horvitz-Thompson estimator with weights proportional to the inverse of the selection probability for each participant (i.e., low screen scores were “weighted up”, and high scores were “weighted down”).

Analyses were performed on complete cases, i.e. without full information computation or imputation, which resulted in a net sample of 484 children, as can be seen from Table 1 along with variable descriptives.

Examination of skewness and kurtosis indicated that all co-variates, except Peer Problems, Callus Unemotional traits and Disorganized Attachment, were approximately normally distributed. A range of transformations did not succeed in obtaining variables that approached normal distribution of the variables, including their residuals. To avoid violating the normal distribution assumption underlying GLM, the skewed variables were therefore recoded into “none”, “low” and “high” categories. On a scale from 0 to 8, cut offs between “low” and “high” Peer Problems were set to 2.00. Cut offs for “low” and “high” Callous Unemotionality were set to 1.41 on a scale of 1 to 3, while disorganized attachment cut offs were set to 0.36 on a scale from 0 to 1. These cut offs

were set according to the distribution of the variables based on several considerations; a) by including an acceptable amount of units in each category and; b) to create a “low” category with a larger amount of units compared to “high”, in order to avoid an unrealistic representation of the prevalence of these traits as high levels of these traits are considered relatively rare.

An interaction between Peer Problems and Disorganization is theorized to be a significant interaction on developmental changes in Social Competence in children and is therefore included in this analysis. In order to solve the issues with the distribution with Peer Problems and Disorganized Attachment, both the variables were recoded into a categorical variable with three categories in order to be included in the interaction.

Results

The analysis was divided into two blocks as can be seen in Table 2. Block 1 represent each variable's unique predictive value on Social Competence at age 6, when adjusting for gender and social competence at age 4. Block 2 represents each variable's predictive value when all the variables were taken into account. Comparing the blocks gives an opportunity to observe each variable's effect when controlled for the other variables' influence on Social Competence in order to observe an intercorrelation between the variables.

The collective predictive effect of Block 2 was R^2=.20. Social competence at T1 had a relatively strong effect on Social Competence at T2. A comparison of the unstandardized regression coefficients yielded that the effect of Social Competence was reduced when controlling for the other variables, yet the β-value indicated that the positive effect still had the strongest effect on later Social Competence compared to the other variables.

Children with high scores on Inattention and Surgency at age 4 had lower scores on Social Competence at the age of 6, compared with those with low scores of Inattention and Surgency. This effect appeared to increase when taking all variables into account. When adjusting for all variables, Inattention had the strongest negative effect on later Social Competence, followed by Surgency. Gender failed to predict Social Competence when adjusting for all the other variables as opposed to when adjusting for Gender and Social Competence at T1. This was also the case of Effortful Control, where Effortful Control seemed to have a positive effect on Social Competence at T2. This effect was significant in Block 1, whereas Effortful Control failed to predict Social Competence at Block 2.

Hyperactivity had a significantly negative effect on Social Competence in Block 1, while its predictive value seemed to be rationalized when taking all the other variables into account. The opposite can be observed in the case of Impulsivity, whereas Impulsivity, as the only trait except from Social Competence at T1 itself, had a positive effect on Social Competence at T2. This effect

was only observed when taking the other variables into account.

Analysis indicated that children categorized with low levels of Callous Unemotional traits failed to predict Social Competence, while high levels of Callous Unemotional traits had a significant negative effect on Social Competence in both blocks, with a stronger negative effect when controlling for all variables. The same tendency applied for Disorganized Attachment, where children categorized with low levels of Disorganization failed to predict later outcome in Social Competence in both blocks. High levels of Disorganization, however, had a negative effect on later Social Competence in both blocks. Children categorized with both low and high levels of Peer Problems in Block 1 had a negative effect on later Social Competence at T2 for the children in this study. The same negative effect can also be observed when adjusting for all variables for both high and low levels of Peer Problems. The effect of children categorized with low levels of Peer Problems became stronger when controlled for all the other variables. On the contrary, the effect of high levels of Peer Problems was reduced when controlled for all variables at T2. Yet, the effect changes did not lead to substantial changes in the model.

With the exception of the recoded variables of low Disorganized Attachment and low Callous Unemotional traits, Negative Affectivity was the only variable that failed to predict Social Competence two years later, regardless of the other traits.

The interaction between Peer Problems and Disorganized Attachment was significant as can be seen from Table 2, and Figure 1 illustrates this interaction through an effect plot. This figure is based on observed means only, as Complex Samples General Linear Modelling in SPSS does not give an opportunity to make graphical representations of predicted means. High levels of Peer Problems had a stronger negative effect on later Social Competence if combined with Disorganization. Children categorized as without Disorganization but with low levels of Peer Problems had lower scores on Social Competence compared with those without Peer Problems. However, children with no Disorganization and high levels of Peer Problems at 4 years of age seemed to score better on Social Competence compared with those with low levels of Peer Problems. The higher levels of Peer Problems present in the child appeared to affect negative development of Social Competence in those with low levels of Disorganization. High levels of Disorganization seemed to affect Social Competence considerably regardless of the level of Peer Problems present, while the combination of high Disorganization and high Peer Problems appeared to have the greatest effect on Social Competence at T2.

Discussion

Although a fairly large body of research has investigated a range of child predictors of social competence development, most of this research has not taken into account that predictors are

intercorrelated, and therefore the unique effects of various potential causes of social competence has been difficult to discern. To address this lacuna of research I therefore performed multivariate analyses of a range of child factors hypothesized to affect children's development of social competence, utilizing data from a large community study following children from the age of 4 to first grade. The results showed that some traits that are found to be associated with social competence, failed to predict changes in later social competence when adjusting for other variables, indicating that the development of social competence perhaps is more complex than earlier research as accounted for. While Effortful Control and Hyperactivity failed to predict later changes in Social Competence when adjusting for the other variables, Impulsivity had the opposite effect and appeared to only affect Social Competence changes when adjusting for the other variables in these analyses. Earlier Social Competence, Surgency, Inattention, high levels of Callous Unemotionality and Disorganized attachment along with both low and high levels of Peer Problems were stable predictors regardless of the adjustment made in the analyses, indicating that some variables are greater predictors of changes in social competence, and should be regarded as early markers of later maladjustment. Negative Affectivity, low levels of Callous Unemotionality and Disorganized Attachment failed to predict later changes in Social Competence throughout the analyses. The interaction between Peer Problems and Disorganized Attachment predicted a greater negative effect on Social Competence.

Social competence.

Social Competence at age 4 (T1) predicted later Social Competence at age 6 (T2) when adjusting for both Gender and Social Competence alone, but also when taking all variables into account. This finding can be considered natural as early Social Competence can be assumed to be a foundation for later Social Competence, and is therefore known to increase by age (Hay et. al., 2004). Whereas other personality characteristics works as either risk factors or as protective factors with regards to later social competence, the current study shows that low scores on Social Competence itself in preschoolers should be considered an important contributor for later difficulties. This because social competence form a foundation of several developmental trajectories such as friendship and academic performance (Parker & Asher, 1987) where maladaptive development may lead to peer rejection and difficulties in school settings (Kochenderfer & Ladd, 1996). Yet, the reduction of the influence early Social Competence had on later Social Competence, when adjusting for the other variables, illustrated the complex development of Social Competence. It is therefore important to not only consider early social competence as an important contributor to later social competence, but also emphasizing the importance of taking other factors into account.

Temperament

Negative Affectivity. Negative Affectivity were the only trait in this model that did not seem to predict changes in later Social Competence, nor when adjusting for Gender and Social Competence at age 4, neither when adjusting for all variables. These findings differed from other research findings within the field. Research done by Szewczyk-Sokolowki et. al. (2005) on attachment and emotions shows that attachment security and difficult temperament, such as negative affect, were unique and significant predictors of children' positive peer nominations. A meta-analysis by Else-Quest, Hyde, Goldsmith & van Hulle (2006) found no gender differences in preschoolers negative affectivity and research by Denham, McKinley, Couchoud & Holt (1990) found negative affect to be problematic in social interactions. A possible explanation for the lack of predictive effect in Negative Affectivity in the current study may be that the model takes earlier Social Competence and Gender into account which may work as mediating factors. Another possible explanation may be due to differences in methods and instruments used in these analyses.

Effortful Control. When adjusted for Social Competence and Gender at age 4, Effortful Control were the only aforementioned trait that affected Social Competence outcomes positively when adjusted for Social Competence and Gender at 4 years of age, except social competence itself. The ability to inhibit a dominant response for a more appropriate subdominant response appears to be an advantage in terms of social competence. This is according to previous research linking different aspects of inhibitory control to preschoolers social-emotional competence and higher ratings on social skills and interactive play (Kochanska et. al., 2009; Mathieson & Banerjee, 2010; Rhoades et. al., 2009). Lengua et. al. (2007) however suggested that a child's effortful control plays less of a role in forming social competence than contextual and socialization experiences. Findings of Olson and colleagues is also contradictory with regards to the current analyses of Effortful Control's effect on Social Competence, where their results yielded that children's effortful control at age 3 was a negative predictor of externalizing behavioral problems above and beyond IQ, anger and psychological adversity (Olson, Sameroff, Kerr, Lopez & Wellman, 2005).

According to Rhoades and colleagues (2009) little research is done examining how effortful control may interact with other predictors (such as gender, attention skills, emotional knowledge) or how it may relate to social competence and behavior problems in young children.

When adjusting for other variables in the current study, Effortful Control had no predictive effect on later Social Competence. This implies that other variables act as mediators or confounders for the effect of Effortful Control.

The lack of predictive value of Effortful Control when adjusted for the other variables is somewhat surprising, as earlier research has fond strong positive relations between effortful control and social competence. This finding calls for more research on the nature of the interactions

between effortful control and social competence along with potential contributing traits, in order to explore and understand the characteristics that mediate effortful control and comprise social competence.

Surgency. Children scoring high on Surgency evidenced comparatively poorer Social Competence than children scoring low on Surgency, even when adjusting for Gender, previous Social Competence and all the other variables. This indicated that Surgency alone at age 4 was a strong predictor of changes in later Social Competence. Earlier research done on surgency has given ambiguous results. The findings done by Mathieson and Banerjee claiming that surgency was associated with less social withdrawal, and not correlated with disruptive peer play, suggests that children with high levels of surgency may or may not exhibit this kind of problematic peer play. Less social withdrawal could implicate a better social competence along with high levels of surgency, yet, children with a combination of high surgency with low effortful control and high negative affect could predict negative developmental trajectories (Mathieson & Banerjee, 2010). Derryberry & Rothbart (2001) have found strong relations between anger and surgency, as has He et. al. (2013) linking infants high on infant anger rated by mothers at 4 years of age as happier, more sociable, more active and less shy, compared to children with low infant anger. The findings by Derryberry & Rothbart and He and colleagues suggest that surgency in preschoolers would be related to traits associated with a positive effect on social competence. These findings were not replicated in this study.

Surgency is also found to be related to impulsivity (Sleddens et. al., 2013) which also had a significant effect on Social Competence in this study, however the effect was positive. Surgency may be related to a lack of impulse control, which is correlated with a diverse range of behavioral and learning problems in school aged children (Olson, 1989). Whether a surgent temperament creates problem for children appears to depend on the ability to control their behavior in appropriate ways depending on the setting. The lack of behavioral regulatory competencies has been associated with externalizing problems (Rubin et. al., 1995). Surgent, poorly controlled children tend to be more aggressive and therefore more rejected by other peers (Gunnar, Sebanc, Tout, Donzella, & van Dulmen, 2003). A consequence of peer rejection is less social experience which in turn may lead to less social competence. This may be a possible explanation of why Surgency lead to a poorer development of Social Competence in this study.

Attachment

Disorganized Attachment. Children categorized with high levels of Disorganization predicted lower scores on later Social Competence. Low levels of Disorganization, however, failed to predict later negative development in Social Competence. Low levels of Disorganization in early

childhood therefore does not seem to necessary have a negative effect on later Social Competence. These interpretations are based on the aforementioned cut offs made for this analyses and should be interpreted with caution. The effect of high levels of Disorganization is also apparent when controlling for the other potential contributors, hence making high levels of Disorganization at 4 years of age a negative predictor with regards to Social Competence scores at the age of 6. Although earlier research on the association between attachment and later social competence in kindergartners have been ambigous (Bohlin et. al., 2000), the current results is consistent with other findings, such as the works of Carlson (1998), linking infants with high levels of disorganization with a vulnerability of significant long-term effects on social and emotional development. The same tendency can be found in kindergartners according to Lyons-Ruth where children with a disorganized attachment can be associated with more aggressiveness in kindergarten, making disorganization a possible precursor to later coercive childhood behavior (Lyons-Ruth, 1996). Disorganized attachment has been found to be related to externalizing problems such as early environmental risk variables including maternal relationship, care-giving style and overall risk status as well as specific forms of maltreatment (Carlson, 1998).

The predictive effect of Disorganization relative to Social Competence found in this study is in accordance with earlier research within the field as disorganized attachment may certainly be considered an important risk factor in the development of child psychopathology, and could be an early sign of psychopathology itself (van Ijzendoorn et. al. 1999). Early disorganization is also related to dissociative symptomatology (Carlson, 1998). Based on the excessive research on later outcome within the field, children with Disorganization at the age of 4 should be considered eligible for intervention- and social skill enhancement programs, as disorganization have been found to affect several domains in child development. Background information and home interventions including parent-child interactions would be of interest with regards to preventive and promotional measures.

Peer Problems

The findings in the current study suggesed that children categorized with both high and low levels of Peer Problems significantly predicted lower scores on Social Competence outcome two years later, regardless of the other variables in this model. The indication of Peer Problems as an influential contributor with regards to a maladaptive Social Competence should be considered important. This is also consistent with previous research assessing social competence and positive peer relations as a joint dyad in preschool children (Pellegrini & Glickman, 1991; Waters & Sroufe, 1983). Peer problems such as peer rejection is considered a result of absence of social skills (Ladd, 1999) and theories about how children acquire such skills might work as an avenue for explaining

the origins of children's relational difficulties with peers (Elliott & Gresham, 1993). Children with special educational needs are also considered to be more neglected and rejected by peers compared to children without additional follow-up plans in schools (Kvello, 2006). Previous research by Henricsson & Rydell (2006) indicates that pro-social behavior is seen as a protective factor in terms of peer acceptance for problematic children, while withdrawal from peers contribute to higher problem levels along with lower school achievement.

Successful relations with peers in play should be encouraged as early as kindergarten-aged children, as it is associated with the quality and level of engagement in a wider classroom context (Coolahan et. al., 2000). Socially rejected kindergartners with a stable mutual friendship with at least one peer appear to have better social, emotional and moral skills compared to children with peer problems without such a friendship (Peterson & Siegal, 2002).

It seems as peer problems can be of significance in terms of psychosocial adjustment as social problems such as rejection from peers seems to be caused by, and contribute to, psychosocial difficulties (Martin et. al., 2003). The current analyses indicated that the effect of both low and high Peer Problems appeared to be relatively equal. It is important to note that these are theoretical created categories created for this purpose, whereas different cutoffs could lead to different findings. However, as the predicted Social Competence outcome appeared to be relatively equal, regardless of perceived levels of Peer Problems, children with low level of Peer Problems have a relatively equal risk of a maladaptive Social Development compared to children with high levels of Peer Problems.

The main focus in the current analyses was to observe whether Peer Problems itself could function as a stable predictor of later Social Competence outcomes, or not. When using none as a reference category the illustration of how low and high levels of peer problems affects Social Competence can be obtained. Even though the categories of high and low can not be compared directly, high levels of Peer Problems seemed to have a greater impact on later Social Competence.

Children with peer problems, such as rejection from others, may be at greater risk for later developmental difficulties and research shows that it is possible to determine early markers of maladjustment as early as in preschool-aged children (Parker & Asher, 1987). This implies that children associated with peer problems in kindergarten would benefit from, and therefore should be admitted to, social skills intervention programs in order to minimize the possible negative effect peer problems has on the development of social competence.

Impulsivity, Hyperactivity and Inattention

Impulsivity. The results in this analysis suggesed that preschool Impulsivity only predicted later Social Competence when adjusting for all variables in the model. The effect is positive,

making children scoring high on the Impulsive scale at 4 years of age more socially competent at 6 compared to those scoring low on Impulsivity at 4 years of age. This finding is somewhat divergent from earlier findings within the field of child impulsivity, such as Olson's study where impulsivity was considered essential for conceptualizing normal versus abnormal child development, associating children with impulsivity to be at risk of being disliked by peers, and (Olson, 1989).

Earlier research have also established that problems with impulsivity arise around 3-4 years of age (Barkley, 1997), but by the onset of early school age period one can argue for the forming of two different subtypes of impulsivity: The “cognitive” and “delay” dimensions may contribute to different outcomes in children in regards of social competence. The latter is more regarded to indexing compliance with social expectations for a social correct behavior (Olson, 1989).

The reorganizations of complex social behavior in preschoolers may explain why the “delay” type of impulsivity is related to social maladjustment, opening for a possibility of the “cognitive” part of impulsivity at age 4 as a trait that not necessarily will provide a risk for later changes in social competence.

With regards to the current study, Impulsivity appeared to have no unique effect on Social Competence, when adjusted for Gender and Social Competence, but the significant effect observed when controlled for the other variable suggested that Impulsivity share a predictive effect with other variables in these analyses.

The aforementioned trait of Surgency have been found to be linked to impulsivity (Sleddens et. al., 2013) which may serve as a possible explanation towards why Impulsivity appears to be significant only when adjusted for the other variables in the model. However, Surgency predicted a negative outcome on later Social Competence, whereas Impulsivity predicted a positive outcome. According to Eisenberg and colleagues, (1998, in Cumberland-Li, Eisenberg & Reiser, 2004) it is possible that some children are implulsive in ways that are seen as positive (e.g. impulsivity to give things away to others). This may serve as an explanation of the positive effect of Impulsivity on Social Competence change in this study.

Hyperactivity. Analysis indicates that Hyperactivity only predicted later Social Competence when adjusting for Gender and earlier Social Competence as opposed to when all variables were taken into account. The effect was negative, making high scores on Hyperactivity at age 4 an indication of lower scores on Social Competence at age 6. This is in accordance with earlier findings from McGee, Partridge, Williams & Silva (1991), who suggests that hyperactivity at age 3 was a strong predictor of increased risk for adolescence problems through 15 years of age, and at age 5 both parent and teacher rated the hyperactive children with more problem behaviors.

The findings from the current analysis suggested that, in terms of Social Competence, Hyperactivity is rationalized by other potential contributors. The co-morbidity of children with

hyperactivity, such as impulsivity and inattention, may serve as an explanation why hyperactivity looses its explanation effect when adjusting for traits such as the aforementioned. Research on the association between hyperactivity and peer victimization and rejection have found a significant effect, however, research done by Perren and colleagues found this effect to be mediated when controlling for conduct problems. This implies that the hyperactive kindergartner without any conduct problems not necessarily is considered problematic by others (Perren, von Wyl, Stadelman, Bürgin & von Klitzing, 2006).

Inattention. Inattention predicted a negative outcome of later Social Competence regardless of other traits in the analysis indicating its quality as a negative predictor of changes in Social Competence. Inattention seems to be less often diagnosed compared to hyperactivity and impulsivity in early preschool, and the rarity of tasks requiring sustained attention in preschool environment could serve as an explanation. (Lahey et. al. 1998). The ability to use attention skills in everyday situations is important for adaptive development in later childhood, and inattention is regarded a risk factor for higher levels of externalizing behavior for both genders in early childhood (Hill, Degnan, Calkins & Keane, 2006).

Co-morbidity. Inattention, hyperactivity and impulsivity are traits associated with early markers of the development of ADHD (Spira & Fischel, 2005) and a high co-morbidity rate for these variables are found (Campbell, 1995). The existence of multiple externalizing symptoms has been found to increase the risk associated with early symptoms of ADHD, and preschool children who experience (a combination of) inattention, hyperactivity and impulsivity are likely to show similar problems throughout the elementary school years and into adolescence (Campbell, 1995).

A comprehensive study by Lahey et. al. (1998) found different functional impairments in preschoolers with these three sub-types of ADHD; where children with a hyperactive type of ADHD are at greater risk for social problems and disruptive behavior compared to those with a more inattentive type, which are most at risk for academic problems. ADHD is associated with greater risks for lower academic achievement, poorer school performance and poor peer relations (e.g. Barkley, 1997) which in turn may have a negative effect on social competence as early as in preschool aged children. According to Barkley (1997) the course of ADHD problems regarding hyperactivity and impulsivity arise around 3-4 years of age, while those problems related to inattention emerge around 5-7 years of age, with the entry of formal schooling.

Callous unemotional traits

Children categorized with low levels of Callous Unemotional traits had no significant effect on Social Competence, as opposed to high levels of Callous Unemotional traits. This indicated that children who held some levels of Callous Unemotional traits in childhood, not necessarily would

become affected in terms of Social Competence. Children who at the age of 4 was categorized with high levels of Callous Unemotionality was more likely to be affected by this two years later. Once again it is important to stress that these categories are created on a theoretic assumption where different cutoffs could produce different findings.

There is a paucity on research on callous unemotional traits in early childhood, although individual differences in fearlessness, guilt and empathy are evident as young as 3 years of age implying that measures of callous unemotional traits may be useful in early childhood as well (Willoughby et. al., 2011).

Few studies have been conducted on longitudinal research on callous unemotional traits in children. Callous unemotional traits are relatively stable during a 1 year period in childhood (Pardini, Lockman & Powell, 2007) in the developmental period of late elementary/early middle school, and are stable constructs, based on both parent and teacher report (Barry et. al., 2008; Frick et. al., 2002). Callous unemotional traits are also related to self-reported violent delinquency in middle school and further research in this area is needed in order to target the process involved in the development of problem behavior in these children (Frick et. al., 2002). Callous Unemotional traits are linked to conduct problems, which again is associated with peer victimization and rejection (Perren et. al., 2006). Knowing the severe implications of early childhood callous unemotinality and its affect on development of psychopathology, children with these traits should be exposed to follow-up interventions as early as kindergarten-age.

Interaction between Peer Problems and Disorganized Attachment

Both Peer Problems and Disorganized Attachment was associated with negative outcomes on Social Competence. The interaction between these two traits in the current analyses indicated a negative effect on later Social Competence. This implied that children with a combination of these two traits are at a greater risk of poorer Social Competence at age 6 than those with none or just one of those traits. As can be seen from Figure 1, high levels of Peer Problems affected later Social Competence to a greater extend when combined with low or high levels of Disorganized Attachment. High levels of both traits seemed to affect Social Competence the most. According to this figure it appeared that children with high levels of both Peer Problems and Disorganization had the greatest risk for social maladjustment. Early disorganization has been associated with aggression and avoidance towards peers (Lyons-Ruth, 1996), which in turn could result in peer problems, which in turn will affect the development of social competence with a negative outcome. It is important to note that even though the significant interaction itself is based on predictive values, the effect plot that indicated the nature of this interaction was based on observed means only (Figure 1). The figure, however, illustrate the same tendencies of the interaction between Peer

Problems and Disorganized attachment.

Previous research on the correlation between attachment and peer relations have found that the relation strengthens with the age at which peer relations were measured; the older the sample was when assessed for attachment security, the stronger effect size linking attachment and peer relations together (Schneider et. al., 2001, p. 95). In terms of the current study it is plausible that the children who show an interaction between disorganized attachment and peer problems at 4 years of age will have problems with a greater negative impact on social competence with increased age and that interventions should be regarded necessary.

Limitations

The present study should be viewed in the context of it's limitations. The city of Trondheim is considered to share resemblance with the Norwegian average, even though the representativeness to Norway or other countries is difficult to ascertain. However, this study can add to the current knowledge on the field, by establishing some key indicators on the development of social competence in preschoolers that may be of interest for later research. The importance of longitudinal studies is evident, with greater possibilities with regards to the understanding of early risk factors in terms of social competence.

With regards to assessing young children's development of traits such as effortful control it is important to note that although age related improvements in inhibitory control do occur between 3 to 6 years of age, children less than 5 still have substantial difficulties inhibiting a prepotent response according to Gerstadt and colleagues (1994, in Rhoades et. al., 2009).

Another limitation with this study is the lack of potential external contributing factors. While the model itself gives an indicator of several traits known to affect social competence, it does not account for all the potential developmental trajectories that accounts for development in social competence. However several potential factors are included based on earlier empirical findings, and compared to research on the field this model can be considered quite comprehensive.

Set against these limitations are several strengths, including the number of children participating and the broad collection of data collected from a wide range of raters (such as parents, teachers, kindergarten-employees, public health nurses and researchers from the university research clinic) which gave a broader set of data and made it possible to understand the nature of child social competence more thoroughly. Teachers and kindergarten-employees are regarded good evaluators of children's peer relationships and social competence. This because parents often have less of an opportunity, compared to teachers in kindergarten, to observe their children's social interactions with a wide array of peers (Barry et. al., 2008).

Conclusion

This current study can be considered a contribution to the research of early markers of social competence development, in preschoolers in order to identify traits that could affect social competence in later childhood. Research on social competence in early childhood has shown that several traits in children are relatively stable over a 1-year period or more, and that several traits are found to impact the development of social competence. Understanding the individual differences in the development of social competence emerging from 2-3 years of age will be crucial for understanding later social development. This understanding of potential early identification markers of social difficulties makes it possible to establish which children could benefit from intervention programs. With regards to the research questions analyses found that;

a) The emotion Negative Affectivity did not predict changes in Social Competence, while Effortful Control, originally a significant positive predictor on Social Competence was confounded when controlling for other variables. Surgency was the only emotion in this study that predicted Social Competence change regardless of the other variables at the age of 6 and the effect was negative.

b) In terms of Disorganized Attachment the analyses indicated that controlling for other potential contributors did not affect the negative effect disorganization had on Social Competence. Note that this only appears to apply on children categorized with high levels of Disorganization when low levels failed to predict later changes.

c) The negative effect of Peer Problems was not affected by other potential contributors regardless of children beingcategorized with high or low levels of the trait, implying the strong effect Peer Problems had on later Social Competence.

d) The early markers of ADHD included in the analyses had a more complex effect on later Social Competence. When adjusting for the other variables Impulsivity was significant, however Impulsivity failed to predict changes in Social Competence alone. The opposite appeared to be the case for Hyperactivity, where adjusting for the other potential contributors rationalized the effect of Hyperactivity observed when only adjusting for Gender and earlier Social Competence. Inattention was the only early marker of ADHD that predicted changes in Social Competence regardless of other traits, and the effect was negative.

e) Children categorized with high levels of Callous Unemotional traits had a significant unique negative effect on Social Competence, this was also the case when controlling for the other variables in this model. Low levels on Callous Unemotional traits failed to predict changes in Social Competence.

f) The interaction between Peer Problems and Disorganized Attachment indicated that Peer Problems combined with Disorganization lead to a greater risk for social maladaptive outcomes.

Further research should continue with a focus on establishing a thorough understanding of the collective and unique contribution potential variables have on the development of social competence in order to understand the nature of several potential variables' collective effect on social competence.

Studies incorporating potential contributors outside of the child should also be considered important, as environmental factors have shown to play an important role on child development as well.

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Table 1

Descriptive Statistics

	N	Mean	S.D
Social Competence T1	973	56.62	12.45
Social Competence T2	765	86.93	13.41
Gender	1264	1.50	0.50
Negative Affectivity	901	3.70	0.47
Surgency	901	4.55	0.61
Effortful Control	903	4.81	0.45
Hyperactivity	890	50.15	8.48
Impulsivity	889	45.98	8.90
Inattention	888	48.97	7.86
Callous Unemotional traits	980	1.15	0.28
Disorganized Attachment	742	0.20	0.22
Peer Problems	1273	0.92	1.28
Valdi N	484		

Note: Descriptive statistics for all variables included in the analyses.

Table 2
Predictors on preschool social competence

Predictors at T1	**Block 1: Adjusting for Social Competence of T1 and Gender**					**Block 2: Adjusting for all variables**				
		95% CI					95% CI			
	B	LL	UL	β	p-value	B	LL	UL	β	p-value
Gender	5.23	3.60	6.87	0.20	<.001	0.82	-1.59	3.23	0.03	.506
Social competence	0.31	0.24	0.90	0.29	<.001	0.20	0.10	0.28	0.19	<.001
Negative Affectivity	0.52	-1.45	2.48	0.02	.606	1.34	-0.92	3.61	0.05	.245
Surgency	-3.19	-4.54	-1.83	-0.15	<.001	-3.29	-4.97	-1.61	-0.15	<.001
Effortful control	3.82	1.78	5.87	0.13	<.001	1.93	-0.68	4.55	0.06	.147
Hyperactivity	-0.19	-0.31	-0.06	-0.12	.003	-0.09	-0.35	0.16	-0.06	.468
Impulsivity	-0.10	-0.21	-0.01	-0.07	.071	0.24	-0.08	0.08	0.16	.003
Inattention	-0.25	-0.37	-0.12	-0.15	<.001	-0.35	-0.58	-0.11	-0.21	.004
Callous Unemotional traits, low	0.13	-2.18	2.42	0.00	.920	0.27	-2.49	-3.02	0.00	.847
Callous Unemotional traits, high	-3.45	-6.62	-0.29	-0.08	.033	-5.17	-8.87	-1.46	-0.12	.006
Disorganized Attachment, low	-1.75	4.25	0.75	-0.06	.170	-1.51	-3.98	0.96	-0.05	.229
Disorganized Attachment, high	-5.23	7.95	-2.51	-0.17	<.001	-3.96	-6.63	-1.28	-0.13	.004
Peer Problems, low	-2.70	-4.53	0.87	-0.10	.004	-2.94	-5.06	-0.83	-0.10	.007
Peer Problems, high	-4.05	-6.94	-1.17	-0.09	.006	-3.36	-6.23	-0.50	-0.08	.021
Peer Problems*Disorganization						-2.09	-3.77	-0.41	-0.13	.015
Rsquare						0.20				

Note. CI = Confindence interval; LL = Lower limit, UL = Upper limit.

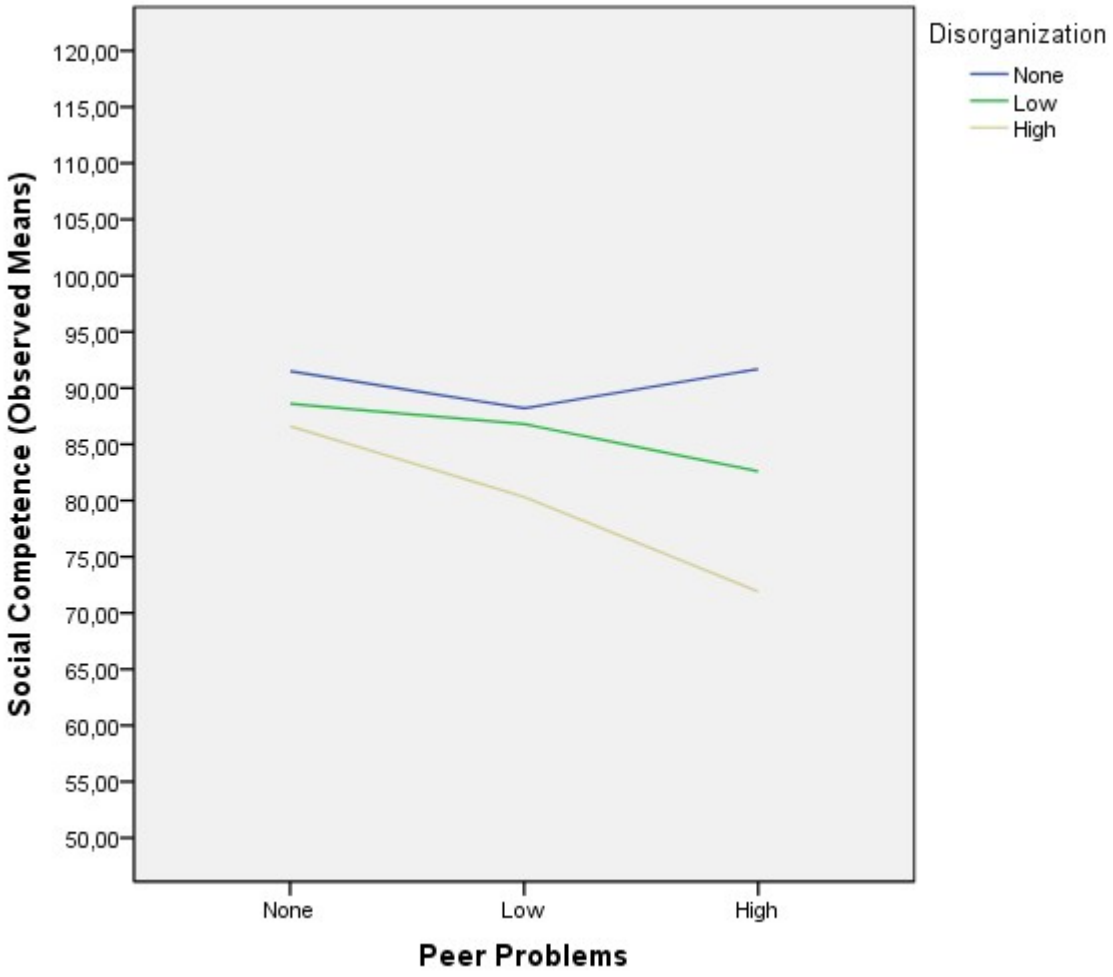

Figure 1. Effect plot presentation of the interaction between Peer Problems and Disorganized Attachment based on observed means after recoding each variable into three variables.