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Research Article

A Cross-Lagged Analysis of Emotion Regulation, Peer Problems, and Emotional Problems in Children With and Without Early Language Difficulties: Evidence From the Millennium Cohort Study

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Purpose: Adolescents with a history of language difficulties are at risk for increased social and emotional difficulties; however, the pathways involved are unclear. We examine the contribution of poor emotion regulation by comparing longitudinal data from children at risk of developmental language disorder (rDLD) and the general population.
Method: Data from the Millennium Cohort Study were analyzed at ages 3, 5, 7, 11, and 14 years. The rDLD group (children with parent-reported difficulties and/or a score of −1.5 *SD*s on the Naming Vocabulary subtest at age 5 years) was compared to a general population group on parent reports of emotion regulation, peer problems, and emotional problems.
Results: In line with the established literature, increased socioemotional problems in individuals with language difficulties were reported. Poor emotion regulation consistently predicted subsequent peer and emotional problems throughout development in both groups. Stronger cross-lag effects were found in the rDLD group for poor emotion regulation at age 3 years predicting age 5 years emotional problems and age 5 years emotional problems predicting age 7 years emotion regulation difficulties. Stronger reciprocal cross-lag effects were also observed in the rDLD group between peer and emotional problems at ages 3 and 5 years. No significant group differences were found in adolescence.
Conclusions: Poor emotion regulation makes a small but significant contribution to later peer and emotional difficulties, and this relationship is stronger in children at rDLD. Early reciprocal peer and emotional difficulties are also stronger in the rDLD group, but these effects dissipate in midchildhood. Nevertheless, the consistent relationship between early emotion regulation difficulties and socioemotional problems throughout development warrants further investigation in individuals with lower language skills.
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Developmental language disorder (DLD)[1] affects approximately 7% of the population and manifests as a difficulty with expressive and/or receptive language that cannot be accounted for by any hearing impairment, neurodevelopmental conditions, or global intellectual disability (Norbury et al., 2016). As well as impaired communication, individuals with language difficulties

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[1]As recommended by a recent panel of experts, we have opted to use the term "developmental language disorder" instead of "specific language impairment" (Bishop et al., 2017). The definition remains the same as many recent definitions of specific language impairment (in that diagnosis is no longer based on a discrepancy between verbal and nonverbal intelligence) and follows long-term studies' adoption of this term (e.g., Conti-Ramsden et al., 2018). Therefore, we refer to DLD throughout the article when referencing older studies that discuss children with expressive or receptive language difficulties with no known cause. In the current study, rDLD refers to children who met criteria for low language based on parent report and/or an expressive language subtest and are considered at risk of DLD (see Method section for more details).

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experience increased levels of emotional difficulties, such as anxiety and depression (Beitchman et al., 2001; Botting, Durkin, et al., 2016; Botting, Toseeb, et al., 2016; Conti-Ramsden & Botting, 2008), and increased levels of social difficulties, such as lower quality friendships and higher rates of shyness and victimization (Durkin & Conti-Ramsden, 2007; Durkin et al., 2017; Redmond, 2011), compared to typically developing (TD) peers. These negative social and emotional outcomes can persist throughout the life span (Clegg et al., 2005). However, there is conflicting evidence over whether these difficulties are predicted by language ability alone or whether there are other factors involved (Yew & O'Kearney, 2013). Given the long-term effects of DLD and associated negative outcomes, there is a clear need to examine the developmental pathways involved. A better understanding of how this relationship manifests may help to provide more effective, targeted interventions.

One model proposed to explain this relationship: The social adaptation model (SAM; Redmond & Rice, 1998) argues that poor socioemotional outcomes in children with DLD are due to adaptive social behaviors resulting from communication difficulties. There is a strong evidence base to suggest that social difficulties mediate emotional difficulties in children and adolescents with DLD. For example, Wadman et al. (2011) found that peer problems predicted concurrent depressive symptoms in adolescents with DLD. Additionally, Forrest et al. (2018) found teacher-rated peer problems partially mediated parent-rated emotional problems both concurrently and longitudinally across childhood and adolescence. These findings are consistent with the literature from the general population (GP) that shows social relationships are key to mental well-being (Arseneault et al., 2010; van Harmelen et al., 2017). However, the SAM (Redmond & Rice, 1998) appears to rely on the modular view of DLD, in that language ability has the strongest effect on socioemotional outcomes and psychosocial traits are intact. A recent meta-analysis illustrates that conflict remains around the predictive variables, including language skills, involved in socioemotional difficulties in individuals with DLD (Yew & O'Kearney, 2013). It therefore may be prudent to explore models that are more reflective of the domain-general approach to DLD, utilizing the usage-based theory of language acquisition (Tomasello, 2009) that posits language is constructed from the social environment, particularly from interactions with caregivers. In the same vein, emotion regulation abilities are first developed through caregivers labelling emotions and modeling strategies (Holodynski & Friedlmeier, 2010). Therefore, we should be exploring possible contributing factors earlier in development. For instance, analysis from the Millennium Cohort Study (MCS) suggests that children at risk of DLD (rDLD) have withdrawal tendencies at 9 months of age, before communication difficulties are apparent (St Clair et al., 2019). Examining potential contributing factors could provide a more nuanced understanding of the pathways leading to increased socioemotional difficulties in the DLD population. Due to the close association between language and emotion regulation in TD children (Vallotton & Ayoub, 2011) and between emotion regulation and socioemotional outcomes throughout the life span as evidenced by a meta-analysis (Aldao et al., 2010), emotion regulation may be a key factor to consider in relation to the social and emotional difficulties associated with DLD. The current study presents a cross-lagged examination of a population cohort throughout childhood and adolescence to evaluate more completely the causal mechanisms involved in language difficulties and negative social and emotional outcomes.

Emotion Regulation and Language

Emotion regulation is the ability to monitor, evaluate, and modify emotions that arise in different situations (Thompson, 1994). According to Gross's (1998) process model, emotion regulation is goal oriented and there are five stages involved: selection of situation, modification of situation, deployment of attention, change of cognitions, and modulation of responses. One of the most common regulation strategies, reappraisal, involves using inner speech to reframe negative situations in a positive light during the change of cognitions stage (e.g., Aldao et al., 2010; Gross, 2002; Gross & John, 2003). The association between language and emotion regulation has been demonstrated consistently in empirical studies of TD children, with vocabulary at 24 months predicting emotional self-regulation at 36 months (Vallotton & Ayoub, 2011). Moreover, Barrett et al. (2007) describe the need for a strong vocabulary to establish "emotional granularity," the ability to accurately distinguish between specific emotions and identify appropriate responses in order to regulate emotions effectively.

Given the centrality of language development to increasing competence in regulating emotions (Eisenberg et al., 2005), early language difficulties could fundamentally alter developmental trajectories in this regard. Emotion regulation can be seen in infancy when babies suck more to self-soothe or avert their gaze to avoid distressing stimuli (Holodynski & Friedlmeier, 2010). In this preverbal stage, children rely on parent support to develop the regulation of their emotions, a stage known as "interpersonal regulation." Children enter the "intrapersonal regulation" stage at approximately 6 years of age when they develop verbal skills to label and express their emotions independently and rely more on "inner speech" to help manage their emotions (Holodynski & Friedlmeier, 2010). Children with impaired language may remain in the "interpersonal regulation" stage for longer or use other maladaptive strategies to regulate their emotions. Indeed, there is evidence to suggest that children with DLD have difficultly labeling emotions (Fujiki et al., 2002). Private speech is reportedly delayed in children with DLD (Lidstone et al., 2012), and they receive significantly worse ratings than their TD peers on measures of emotion regulation (Fujiki et al., 2004). Recent findings from the MCS demonstrate that emotion regulation difficulties at age 3 years are significantly higher in a group with early language difficulties compared to the TD group (St Clair et al., 2019).

Emotion Regulation and Socioemotional Difficulties

Emotion regulation has a strong association with social and emotional functioning in the GP. In order to engage in a successful social interaction, individuals need to regulate their emotions to attend to their conversational partner, as well as choose the appropriate emotional response (Lemerise & Arsenio, 2000). Consequently, emotion regulation abilities impact social outcomes. For instance, longitudinal studies of TD children have demonstrated the moderating effect of adaptive emotion regulation strategies on increased popularity and social competence (Spinrad et al., 2006). Conversely, those who are unable to excite or arouse emotion to an appropriate level for the conversation (i.e., not emoting enough) may be seen as more shy and may be "left behind" by their peers. Children with DLD are often hesitant to initiate conversation and end up on the outskirts of social interactions even though they have a desire to engage with others (Brinton et al., 1997; K. I. Hart et al., 2004). Indeed, Fujiki et al. (2004) found that poor emotion regulation and language ability together accounted for 43% of the variance in social reticence scores in children with DLD, with partial correlations showing unique contributions from both variables. Therefore, emotion regulation may be a contributing factor to the higher rates of peer rejection and withdrawal often seen in children with DLD (Andrés-Roqueta et al., 2016; Maggio et al., 2014). A recent study evaluating the relationship between victimization and emotional competence, one of the components necessary for emotion regulation, found that a better understanding of emotions predicted lower victimization in children, and a diagnosis of DLD moderated this relationship (van den Bedem, Dockrell, van Alphen, Kalicharan, & Rieffe, 2018).

The link between maladaptive emotion regulation strategies and psychopathology is also well established in the GP (Aldao et al., 2010). Longitudinal studies of TD adolescents have demonstrated a positive association between maladaptive emotion regulation and internalizing disorders, such as anxiety (McLaughlin et al., 2011) and depression (Silk et al., 2003). Given the increased rates of negative emotional outcomes such as anxiety and depression in DLD (Conti-Ramsden et al., 2013) and the association between emotion regulation and language discussed above, the relationship between emotion regulation difficulties and negative emotional outcomes in individuals with DLD warrants further evaluation. One recent study examining this association found that maladaptive emotion regulation strategies mediated the relationship between language difficulty and depressive symptoms in adolescents with DLD (van den Bedem et al., 2018). However, participants ranged in age from 8 to 16 years, with a follow-up of 18 months; therefore, earlier developmental trajectories are not covered.

An additional, indirect pathway through which emotion regulation leads to negative emotional outcomes could be social problems leading to feelings of loneliness, anxiety, and depression (Geoffroy et al., 2018). Adolescents with DLD have reported finding social engagement to be a more stressful experience than their TD peers (Wadman et al., 2011). Furthermore, recent findings from the same MCS sample as the current paper show a mediating effect of peer problems in midchildhood on emotional problems in early adolescence (Forrest et al., 2018). Reciprocal effects are also possible, as low mood may encourage withdrawal from social interactions, leading to fewer opportunities to practice social skills and regulate emotions. Indeed, very recent evidence indicates that peer victimization has a stronger link to emotional difficulties in adolescents with DLD than in the TD peers (Kilpatrick et al., 2019). Overall, there is evidence to suggest that emotion regulation, social problems, and emotional problems are interrelated.

Current Study

Although previous research indicates that emotion regulation difficulties predict both social problems and emotional problems in the GP, less is known about the effect on the DLD population. Those studies that have examined emotion regulation in individuals with DLD have focused on clinical populations and have examined social and emotional outcomes separately in childhood and adolescence (Fujiki et al., 2004; van den Bedem et al., 2018). There may be a different pattern in the earlier years before a diagnosis has been received and adaptive strategies have been learned. Children with DLD are typically diagnosed at around 5 years of age (Bishop et al., 2017), and children in general develop more independent emotion regulation abilities from approximately 6 years of age (Holodynski & Friedlmeier, 2010). Additionally, the developmental relationships between emotion regulation and social and emotional outcomes may differ between TD children and those with language difficulties. Children at rDLD have poorer emotion regulation abilities years before a diagnosis of DLD is appropriate (St Clair et al., 2019), suggesting that an emerging deficit in poorer language skills may be related to differential development of emotion regulation skills. It is possible that early differences in emotion regulation abilities may contribute differently and more directly to socioemotional outcomes in children with language difficulties than their TD peers due to limited use of language scaffolding. The current study aims to examine the moderating effect of language difficulties on the pathways between emotion regulation difficulties, peer problems, and emotional problems in early childhood through midadolescence using data from the MCS (Connelly & Platt, 2014). Population cohorts in general are beneficial for assessing temporal causality. Data collection at many time points allows for examination of developmental trajectories that may be omitted from cross-sectional studies or longitudinal studies with follow-up at only one time point. Within the DLD field, analysis of population cohorts is necessary to diversify the literature that has predominantly focused on the clinical cohort of the Manchester Language Study (Conti-Ramsden & Botting, 1999) and is in line with recent recommendations to assess whether the same effects hold in community samples (Bishop et al., 2016). Given the particular importance of

social relationships during adolescence and the evidence that approximately 75% of psychiatric problems experienced in adulthood first manifest in adolescence (Kim-Cohen et al., 2003), socioemotional research that spans childhood and adolescence is particularly desirable. The current study analyzes five time points throughout early childhood into adolescence, extending the work of previous population cohort studies, which have focused on language difficulty and psychosocial outcomes in early childhood (e.g., Levickis et al., 2018; McKean et al., 2017).

The current study will examine the effect of parent-reported emotion regulation difficulties at ages 3, 5, and 7 years on parent-reported peer problems and emotional problems at ages 3, 5, 7, 11, and 14 years. Instead of analyzing language as a construct, participants were categorized into groups of those considered at rDLD and GP status for two reasons. First, children with DLD have disordered language development, not simply a delay, with the majority of the literature investigating DLD and associated socioemotional difficulties examining DLD as an entity based on a clinical cutoff and parental report of poor language functioning (Bishop et al., 2016). Second, previous research has suggested an absence of a linear relationship between language ability and severity of socioemotional problems (Fujiki et al., 2002; K. I. Hart et al., 2004); therefore, analyzing language ability as a continuous scale was not deemed useful. Those at rDLD are expected to receive higher ratings of emotion regulation difficulties, peer problems, and emotional problems than the GP group. It is also hypothesized that poor emotion regulation will predict later peer and emotional problems. Finally, given the early interrelationships between language and emotion regulation, as well as the established link between social and emotional difficulties (Forrest et al., 2018), we expect the interrelationship between emotion regulation peer problems, and emotional difficulties may be stronger in the rDLD group than in the GP group. We expect that the combination of language difficulties with reductions in emotion regulation (as demonstrated in this sample by St Clair et al., 2019) will exacerbate the experience of emotional and peer problems, leading to a stronger relationship from emotional dysregulation to these difficulties in individuals with DLD. Alternatively, it may be that simply higher rates of emotion regulation difficulties could be related to the elevated rates of emotional and peer problems but have a similar relationship as is found in the GP. This study will evaluate these two possibilities.

Covariates of sex and poverty (as measured by the Organisation for Economic Cooperation and Development [OECD] poverty index) will be entered into the analyses. Extant literature shows a sex difference in emotional outcomes, with significantly higher rates of internalizing problems in female adolescents compared to male adolescents (Rescorla et al., 2007). Furthermore, poverty has a negative influence on language development, with children from lower socioeconomic backgrounds being exposed to fewer words and exhibiting a lower vocabulary than their peers from more advantaged backgrounds (B. Hart & Risley, 1995).

Method

Ethics

The original study received full ethical approval from the National Health Service Multi-Centre Research and Ethics Committee at each wave (Connelly & Platt, 2014).

Participants

Participants were obtained from six waves of the MCS (University of London, Institute of Education, Centre for Longitudinal Studies, 2017a, 2017b, 2017c, 2017d, 2017e, 2020). All children were born in the United Kingdom (England, Northern Ireland, Scotland, and Wales) between September 2000 and January 2002 and were assessed at 9 months and 3, 5, 7, 11, and 14 years of age. Children from hard-to-reach subgroups, such as ethnic minority backgrounds and disadvantaged backgrounds, were oversampled in order to provide a sample that was more reflective of the U.K. population. For example, in the first wave of data collection, 4.8% of participants are Pakistani, 3% have mixed ethnicity, 2.5% are Indian, 2% are Bangladeshi, 2% are Black African, and 1.3% are Black Caribbean (Connelly & Platt, 2014). See the study of Plewis et al. (2007) for further details of the baseline sample. The full sample size was 19,518 children. In total, 5,256 individuals were excluded from this analysis (537 due to multiple births and 4,719 due to missing rDLD status data). The current sample is 14,262 singletons (see Supplemental Material S2). All measures were informant report (referred to as the "main respondent" in the MCS documentation).

Table 1 shows the demographics of the sample used in the current study. The rDLD group consisted of 891 individuals at age 5 years or 6.3% of the sample. There were significantly fewer females in the rDLD group compared to the GP group, which is in line with previous findings of sex differences in DLD (St Clair et al., 2011). Significantly more children were below the OECD poverty line at age 5 years in the rDLD group compared to the GP group. The rDLD group performed significantly worse on the British Ability Scales (BAS; Elliot et al., 1997) Pattern Construction measure of spatial ability. There was no significant group difference in prematurity, and all children were the same age at Wave 3 of data collection (see Table 1).

Measures

rDLD

There was only one standardized measure of language available; therefore, no formal diagnosis of DLD can be made. Instead, an rDLD variable was created denoting children at risk of developing DLD based on parent-reported language difficulties and/or low vocabulary ability at age 5 years. rDLD was evaluated at age 5 years as children with a language delay have been found to catch up with their peers by around this age (Bishop & Edmundson, 1987). Parent-reported language difficulties were defined by endorsement of "language developing slowly" or

Table 1. Demographics of sample.

Demographic variables at age 5 years	rDLD (*n* = 891)	GP (*n* = 13,371)	All (*n* = 14,262)	rDLD vs. GP
Female (%)	29.4	48.5	46.8	0.44 [0.37, 0.52]^***
Premature (%)	9.8	7.3	7.5	*ns*
Poverty indicator (%)	55.8	28.4	31.0	3.21 [2.69, 3.83]^***
BAS Naming Vocabulary	38.64 (0.53)	56.21 (0.18)	54.67 (0.23)	−15.92 [−16.88, −14.96]***
BAS Pattern Construction	40.50 (0.62)	51.19 (o.18)	49.58 (0.21)	−9.42 [−10.69, −8.14]***
Age at Wave 3 (years;months)	5;2.5	5;2.5	5;2.5	*ns*

Note. Mean scores and standard errors are presented. Statistics are *b* coefficients or odds ratio when ^ is reported (95% confidence interval). All analyses control for sex and poverty (Organisation for Economic Cooperation and Development). BAS Naming Vocabulary and BAS Pattern Construction are *T* scores ($M = 50$, $SD = 10$). rDLD = risk of developmental language disorder; GP = general population; BAS = British Ability Scales. ; *ns* = not significant.

***$p < .001$.

"doesn't understand others" at age 5 years ($n = 440$). Low vocabulary was defined as scoring 1.5 *SD*s below the mean (*T* score of 35 or below) on the BAS Naming Vocabulary subtest ($n = 529$; Elliott et al., 1997). This test provides a measure of expressive language ability, requiring participants to name as many pictures of objects as possible from the 36 options and has a reliability coefficient of .65 at age 5 years (Elliott et al., 1997). There were 78 children who met both criteria of parent report of language difficulties and low score on the Naming Vocabulary subtest.

We used a combination of parent-reported difficulties alongside a standardized language test as Bishop and McDonald (2009) note that the combination of measures from different sources provides a more comprehensive picture of language abilities. Furthermore, use of parent report of language difficulties within a large-scale cohort has precedence. See the study of Hughes et al. (2016) for a similar measure of parental report of language difficulties relating to social and emotional problems. St Clair et al. (2019) have documented that this categorization of rDLD is associated with reduced naming vocabulary at age 3 years and reduced verbal reasoning skills at age 11 years in comparison to the GP group.

In total, 6.3% of the sample ($N = 891$) were included in the rDLD group at age 5 years, which is a conservative rate given the recent U.K. prevalence rate of 7.6% for DLD (Norbury et al., 2016). Further details of the numbers in the rDLD group by only the parent report or only the Naming Vocabulary subtest, as well as additional comparisons across variables of interest, are provided in Supplemental Material S1.

As we were interested in those with a primary language difficulty, children who met criteria for the rDLD group but whose language difficulties could be explained by additional factors were not included in the rDLD group. This consisted of children who were in a family environment where English was not spoken in the home ($n = 320$), as well as diagnoses and parent reports of autism spectrum disorder ($n = 487$), hearing difficulties ($n = 1,229$), or Down syndrome ($n = 12$). No other reports of additional support or special educational needs related to global intellectual disability were reported in the rDLD group. All participants who did not meet criteria for rDLD but may have had additional developmental difficulties (e.g., hearing difficulties or autism spectrum disorder) were included in the GP comparison group. This is in line with recent recommendations for control groups with developmental disorders as outlined by Fombonne (2016). Of the total sample eligible for the study, 93.7% were included in the GP group at 5 years ($N = 13,371$).

Emotion Regulation Difficulties

This variable was measured at ages 3, 5, and 7 years and was derived from the mean of five items taken from the Child Social Behaviour Questionnaire (for more information about this derived variable, see Johnson et al., 2015). Items were rated on a scale of 1–3 by the main respondent (predominantly mother) and included "shows mood swings," "gets over excited," "easily frustrated," "gets over being upset quickly" (reverse-scored), and "acts impulsively." A higher score indicates more difficulty regulating emotions. Given the small number of items in this scale, interitem correlations instead of Cronbach's alpha were used to measure reliability (Pallant, 2010). The interitem correlations for the emotion regulation variable were .22 at age 3 years, .26 at age 5 years, and .29 at age 7 years. Interitem correlations ranging between .2 and .4 are said to be sufficient (Briggs & Cheek, 1986).

Emotional and Peer Problems

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) was completed by the main respondent (predominantly mother) at ages 3, 5, 7, 11, and 14 years. This 25-item scale is composed of five subscales (Emotional Problems, Conduct Problems, Hyperactivity, Peer Problems, and Prosocial). Each item is rated on a scale of *not true* (0), *somewhat true* (1), and *certainly true* (2), with a higher score indicating more problems. The scales of interest were the Emotional Problems and Peer Problems subscales, each

consisting of five items measuring worries or low mood and difficulties with friendships (see Goodman, 1997). Internal consistency is .67 for the Emotional Problems subscale and .57 for the Peer Problems subscale (Goodman, 2001).

Additional Measurements

The BAS II Pattern Construction subtest (Elliott et al., 1997) was administered at age 5 years. This subtest provides a measure of spatial ability by requiring children to copy designs using colored blocks.

Statistical Analysis

Data were analyzed using Stata 14 (StataCorp, 2015) with the prefix *svy* to adjust for survey data (Ketende & Jones, 2011). The *svy* prefix allows for sampling weights, which account for cluster sampling and stratification within the survey design to provide an accurate estimate of the underlying U.K. population (using a finite population correction factor). Additionally, the sampling weights account for attrition in each wave. The *mi impute* function in Stata 14 (StataCorp, 2015) was used to account for missing data on the emotional problems, peer problems, and emotion regulation variables at all ages. Twenty imputed data sets were created. A total run length of 200 chained iterations was imputed using the method of predictive mean matching (see Supplemental Material S3). The variables of Emotional Problems and Peer Problems were highly skewed, with many participants receiving a score of 0; therefore, negative binomial regression was used to analyze the rDLD and GP group differences for these outcomes. Confounding variables of sex and poverty (as measured by the OECD definition: income 60% below median income) were controlled for in all regression analyses. Nonverbal IQ was not included as a covariate in accordance with suggestions for neurodevelopmental studies (Dennis et al., 2009). Cross-lagged path analysis was conducted using Mplus (Muthén & Muthén, 1998–2012) using the imputation function. This allowed for analysis of associations between the variables of emotion regulation, peer problems, and emotional problems at each of the five time points (ages 3, 5, 7, 11, and 14 years). The model used the robust maximum likelihood estimation (estimator = MLR), which assumes that remaining missing data are missing at random. Standardized path coefficients are presented in both figures. Correlations between variables were computed at each time point, although not shown in the figures for ease of readability. Group × Predictor interaction terms compared the strengths of the pathways between the groups.

Results

Group Difference in Emotion Regulation, Peer Problems, and Emotional Problems

Table 2 demonstrates the group differences in emotion regulation, peer problems, and emotional problems. The rDLD group received significantly higher ratings of emotion regulation difficulties than the GP group at each of the three time points. Parent reports of peer problems were significantly higher for the rDLD group compared to the GP group at all five time points. Similarly, significantly higher ratings of emotional problems were reported for the rDLD group compared to the GP group at all five time points.

Cross-Lag Analysis

For the GP group, all paths were significant at the $p < .001$ level (see Figure 1). Autoregressions showed a similar pattern of stability between ages 3 and 14 years for peer and emotional problems, ranging from .34 and .37 to .48 and .49, respectively. Emotion regulation was slightly more stable with standardized coefficients of .51 between ages 3 and 5 years and .62 between ages 5 and 7 years. The largest cross-lag effect was between emotion regulation difficulties at age 5 years and emotional problems at age 7 years ($\beta = .14$, $SE = .01$). Similar effects were found for poor emotion regulation at age 5 years predicting peer problems at age 7 years and for poor emotion regulation at age 7 years predicting peer and emotional problems at age 11 years (all pathways were $\beta = .13$, $SE = .01$). This pattern was replicated for poor emotion regulation at age 7 years predicting peer and emotional problems at age 14 years ($\beta = .10$, $SE = .01$). Peer and emotional difficulties predicted emotion regulation problems to a lesser extent.

Different pathways emerged when the rDLD group was modeled (see Figure 2). Emotion regulation difficulties at ages 3, 5, and 7 years predicted peer and emotional problems at all later time points (ages 5, 7, 11, and 14 years), but these significant paths were not always reciprocal. Specifically, emotional problems at age 3 years did not significantly predict emotion regulation difficulties at age 5 years, and peer problems at age 5 years did not predict poor emotion regulation at age 7 years. Additionally, there were no significant reciprocal cross-lag effects of peer and emotional problems between ages 5 and 7 years or ages 7 and 11 years. The strongest cross-lag effects were between peer problems at age 3 years and emotional problems at age 5 years ($\beta = .21$, $SE = .04$, $p < .001$) and between emotional problems at age 11 years and peer problems at age 14 years ($\beta = .21$, $SE = .04$, $p < .001$).

We next tested whether the paths were equivalent across both groups with Group × Predictor interaction terms. Paths with a coefficient difference of .05 or more between the two groups were deemed as having the potential to differ significantly. Only these paths were tested in order to reduce the number of comparisons made and decrease the risk of making a Type I error. Two autoregression pathways measuring the stability of variables across time were tested. The path between emotion regulation difficulties at ages 5 and 7 years showed stronger stability in the GP group than in the rDLD group ($\beta = .02$, $SE = .01$, $p < .05$), but there was no significant group difference between autoregressions within the emotional problems variable at ages 3 and 5 years ($\beta = .02$, $SE = .01$, $p = .12$).

Table 2. Social and emotional problems in risk of developmental language disorder (rDLD) group and general population (GP) group.

Variable		rDLD (*n* = 891)	GP (*n* = 13,371)	All (*n* = 14,262)	rDLD vs. GP
Emotion regulation difficulties					
	Age 3 years	2.01 (0.02)	1.87 (0.01)	1.87 (0.01)	.08 [.04, .12]***
	Age 5 years	1.91 (0.02)	1.70 (0.01)	1.71 (0.01)	.14 [.10, .18]***
	Age 7 years	1.91 (0.03)	1.72 (0.01)	1.75 (0.01)	.11 [.06, .16]***
SDQ peer problems					
	Age 3 years	2.11 (0.08)	1.44 (0.02)	1.53 (0.02)	.27 [.19, .35]***
	Age 5 years	1.68 (0.07)	1.05 (0.02)	1.13 (0.02)	.33 [.24, .42]***
	Age 7 years	1.83 (0.09)	1.16 (0.02)	1.27 (0.02)	.33 [.23, .43]***
	Age 11 years	1.96 (0.09)	1.33 (0.02)	1.45 (0.02)	.25 [.16, .34]***
	Age 14 years	2.24 (.11)	1.78 (0.03)	1.88 (0.03)	.12 [.02, .23]*
SDQ emotional problems					
	Age 3 years	1.77 (0.08)	1.29 (0.02)	1.35 (0.02)	.23 [.14, .31]***
	Age 5 years	2.10 (0.09)	1.29 (0.02)	1.37 (0.02)	.42 [.33, .51]***
	Age 7 years	2.19 (0.11)	1.48 (0.02)	1.56 (0.02)	.32 [.21, .43]***
	Age 11 years	2.48 (0.10)	1.84 (0.03)	1.93 (0.03)	.25 [.19, .33]***
	Age 14 years	2.58 (0.13)	2.06 (0.04)	2.14 (0.03)	.23 [.11, .34]***

Note. Mean scores and standard errors are presented. Statistics are *b* coefficients (95% confidence interval). All analyses control for sex and poverty (Organisation for Economic Cooperation and Development). SDQ = Strengths and Difficulties Questionnaire.

*$p < .05$. ***$p < .001$.

Seven cross-lag pathways were tested for interaction effects: three between ages 3 and 5 years, two between ages 5 and 7 years, and two between ages 11 and 14 years. In the early years, the rDLD group showed a stronger link between poor emotion regulation at age 3 years and emotional problems at age 5 years compared to the GP group ($\beta = .04$, $SE = .01$, $p < .01$). Significantly stronger effects in the rDLD group were also found for peer problems at age 3 years predicting emotional problems at 5 years ($\beta = .05$, $SE = .01$, $p < .001$) and for emotional problems at age 3 years predicting peer problems at 5 years ($\beta = .04$, $SE = .01$, $p < .01$). In midchildhood, a stronger effect in the DLD group was found for emotional problems at age 5 years predicting emotion regulation difficulties at age 7 years ($\beta = .02$, $SE = .01$, $p < .05$); however, this relationship was not reciprocal as there was no significant group difference in emotion regulation difficulties at age 5 years predicting emotional problems at age 7 years ($\beta = .01$, $SE = .01$, $p = .45$). Finally, in adolescence, there was no significant interaction effect for peer problems at age 11 years predicting emotional problems at age 14 years ($\beta = .01$, $SE = .01$, $p = .21$) or for emotional problems at

Figure 1. Path analysis of emotion regulation difficulties (Emo Reg Difficulties), Strengths and Difficulties Questionnaire emotional problems (Emo Problems), and Strengths and Difficulties Questionnaire peer problems (Peer Problems) at ages 3, 5, 7, 11, and 14 years in the general population group. A higher score in emotion regulation difficulties indicates more difficulties in this area. Standardized coefficients are presented. All paths are significant at the $p < .001$ level.

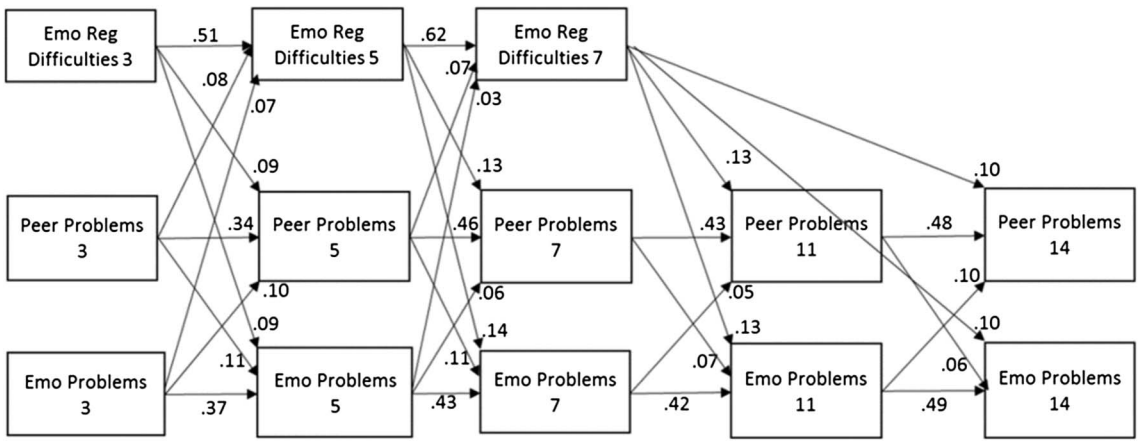
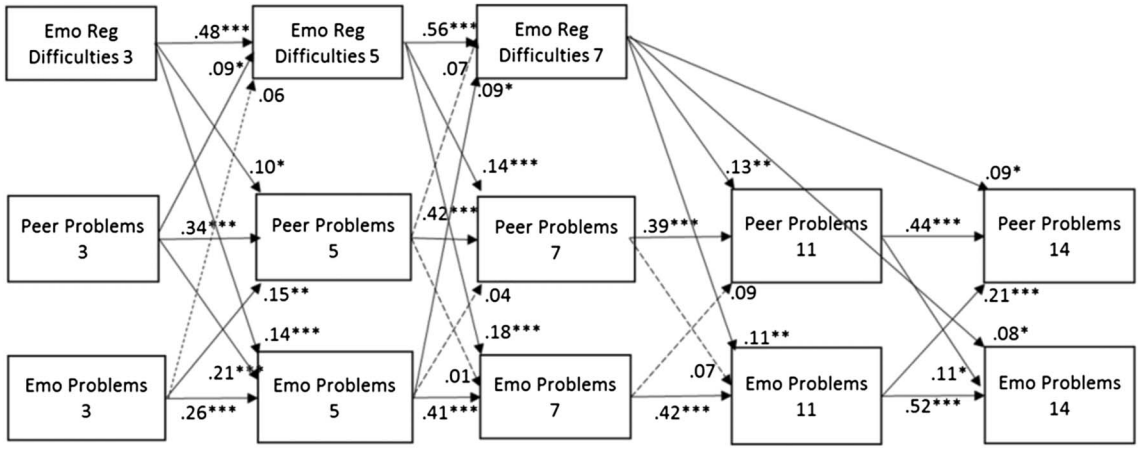


Figure 2. Path analysis of emotion regulation difficulties (Emo Reg Difficulties), Strengths and Difficulties Questionnaire emotional problems (Emo Problems), and Strengths and Difficulties Questionnaire peer problems (Peer Problems) at ages 3, 5, 7, 11, and 14 years in the risk of developmental language disorder group. A higher score in emotion regulation difficulties indicates more difficulties in this area. Standardized coefficients are presented. Dashed lines indicate nonsignificant paths. ***$p < .001$, **$p < .01$, *$p < .05$.



age 11 years predicting peer problems at age 14 years (β = .01, $SE = .01$, $p = .26$).

Discussion

The current study used a population cohort to investigate the pathways between early emotion regulation difficulties, peer problems, and emotional problems in young people with and without an rDLD. As well as replicating previous clinical findings of increased socioemotional difficulties in children and adolescents with language difficulties in a population cohort, this study has expanded upon the limited research into the role of emotion regulation difficulties on these negative outcomes (Fujiki et al., 2004; van den Bedem et al., 2018).

Supporting the first hypothesis, the results show that emotion regulation difficulties, peer problems, and emotional problems are significantly higher in the rDLD group than in the GP group, at each of the three time points. These results are in line with previous studies that found increased social and emotional problems in both clinical samples (St Clair et al. 2011) and community samples (St Clair et al., 2019). These findings also suggest that children who are at rDLD have more difficulty managing their emotions appropriately than their peers, which is consistent with previous conclusions from a clinical sample (Fujiki et al., 2002). This is an important finding, replicating results from clinical samples within a population cohort. It is important to note that, similar to previous findings (St Clair et al., 2011), these difficulties do not reach clinical levels for the rDLD group as a whole. However, there may well be a higher proportion of individuals above the clinical threshold, and it is still a cause for concern that children at rDLD may be at a disadvantage compared to their TD peers due to their poorer socioemotional experiences. Equally, the findings demonstrate that these difficulties are reported from an early age, before the rDLD was categorized at age 5 years. This is in contrast to the premise of Redmond and Rice's (1998) SAM that suggests children modify their behavior due, in part, to the biases and opinions of others about their language abilities. A more nuanced possibility is that challenges in early emotion regulation may co-occur with children modifying their behavior in response to the implicit and sometimes explicit behaviors of others, perhaps reflecting our findings of increased peer difficulties. Additional in-depth evaluation of the interrelations between poor emotion regulation, peer problems, and emotional difficulties in children with DLD is needed to further evaluate this possibility.

In the second hypothesis, the cross-lag analysis supports the hypothesis that poor emotion regulation predicts later peer and emotional problems, but there were distinct pathways for each group. For instance, the GP group demonstrated significant reciprocal relationships between emotion regulation difficulties, peer problems, and emotional problems longitudinally, such that each domain influenced the other two domains at the next time point. This is in contrast to McLaughlin et al. (2011), who found that emotion regulation difficulties in TD adolescents predicted anxiety, but not vice versa. However, it is worth noting that the McLaughlin et al. study used self-report for all measures and examined a latent variable of emotion dysregulation, which consists of more disruptive regulation strategies. Conversely, not all paths were reciprocal when the rDLD group was modeled. For example, peer and emotional difficulties appeared to be less influential on emotion regulation difficulties in the rDLD group, with no effect of emotional problems at age 3 years or peer problems at age 5 years on later emotion regulation difficulties. Similarly, there were no significant reciprocal cross-lagged paths between peer and emotional problems at ages 5 and 7 years or ages 7 and 11 years in the rDLD group. This may indicate

that these children's emotion regulation difficulties are more integral to their social and emotional development during midchildhood in the rDLD group, rather than as a by-product of any problems in peer situations or due to elevated emotional problems. However, these paths became significant in the rDLD group in adolescence: In particular, emotional problems at age 11 years had more of an effect on peer problems at age 14 years than poor emotion regulation at age 7 years did. However, this could be due to the closer temporal proximity in measurements between ages 11 and 14 years. In contrast, an earlier examination of this cohort found that teacher-rated peer problems at age 7 years partially mediated parent-rated emotional problems, both concurrently and at age 14 years (Forrest et al., 2018). Nevertheless, it is important to note that while emotion regulation difficulties are making some contribution, the strongest pathways are the autoregressions showing that an earlier presence of peer or emotional problems predicts these problems in later childhood and adolescence.

Finally, the third hypothesis that the interrelationship between emotion regulation difficulties, peer problems, and emotional problems would be stronger in the rDLD group than the GP group was supported to an extent. The stronger link between poor emotion regulation at age 3 years and emotional problems at age 5 years in the rDLD group is perhaps reflective of the longer "interpersonal regulation" stage (Holodynski & Friedlmeier, 2010) that these children may experience due to their language difficulties impeding their ability to understand parents' labeling of emotions and modeling of emotion regulation strategies. Being unable to effectively regulate emotions and respond appropriately may contribute to emotional difficulties, such as feelings of frustration and isolation. This is consistent with previous research on a clinical sample that has shown poor emotion regulation abilities in individuals with DLD contribute to symptoms of depression (van den Bedem et al., 2018). The opposite direction of this relationship is also stronger in the rDLD group, with emotional problems at age 5 years predicting poor emotion regulation at age 7 years. Experiencing higher rates of emotional difficulties as rated by parents using the SDQ, such as worries and fears and feeling unhappy, coupled with limited language to label and express these feelings could lead to difficulties regulating these emotions. The strongest group difference was found for reciprocal cross-lag effects between peer problems and emotional problems in early childhood in the rDLD group, again highlighting the influence of emerging language difficulties on additional socioemotional problems in early childhood. These findings also reinforce the established link between social and emotional difficulties in general (Geoffroy et al., 2018), although recent findings from the DLD literature highlight that peer and emotional difficulties develop together in some, but not all, adolescents with DLD (Conti-Ramsden et al., 2018).

Analysis of the relationship between language disorders and psychosocial problems in population cohorts is needed to diversify the literature in the field (Bishop et al., 2016). By analyzing the MCS, we have extended research from previous community studies focusing on young children (e.g., Clegg et al., 2015; McKean et al., 2017) into the adolescent population, a key time for the onset of later psychiatric disorders (Jones, 2013; Kim-Cohen et al., 2003). The current paper has used cross-lag analysis that allows for prediction over time, accounting for subtle developmental links that cross-sectional studies or longitudinal studies with one time point may miss. Additionally, we have used a GP group (including children with other types of disabilities/profiles) for comparison based on recent recommendations that argue a typically developed control group may overestimate any group differences in negative social and emotional outcomes (Fombonne, 2016). The same pattern of socioemotional difficulties that has consistently been reported in clinical samples of individuals with DLD was found in the current study, using a sample without a formal diagnosis of DLD. We created the rDLD variable using the information that was available in the MCS, namely, the BAS Naming Vocabulary subscale and a parent report of language concerns. These language measures were taken from the third wave of data collection at age 5 years, which is in line with recommendations from a recent Delphi study on diagnosing DLD (Bishop et al., 2016). We excluded participants with hearing difficulties and a diagnosis of autism or other neurodevelopmental disorder. The final rDLD sample reflected 6.3% of the cohort, which is similar to the 7.6% prevalence rate of DLD in the United Kingdom (Norbury et al., 2016). This points to the validity of parent report in identifying a sample of children with language difficulties. Parental concern should be considered when assessing language difficulty because parents can provide more insight into the child's language use in daily functioning than a standardized test. Additionally, this finding raises the issue of children experiencing similar levels of socioemotional difficulties as their peers with a formal diagnosis of DLD but potentially not receiving support if they do not meet criteria for a formal diagnosis. Unfortunately, there were no data to determine how many of the rDLD group went on to develop DLD and receive speech and language therapy.

Nevertheless, it is important to consider the limitations of the current study. A cohort as large as the MCS is subject to attrition at later time points. However, this was controlled for by using the *svy* command in Stata 14, which adds weights to adjust for attrition in each wave of data collection. Multiple imputation was used to account for missing data in the main variables of interest—emotion regulation difficulties, peer problems, and emotional problems. While this was necessary, the constraints of using imputed data restricted our ability to explore indirect effects in the cross-lag model. For instance, we were unable to investigate how poor emotion regulation at age 3 years indirectly affects outcomes in peer and emotional difficulties after age 5 years. This could have provided more detail about the different pathways in each group. Additionally, the rDLD group is much smaller than the GP group, which may limit the conclusions that can be drawn from these findings, although standardized coefficients were reported.

As is typical of secondary data analysis, there was no control over the measures used. The outcome measures of social and emotional problems and emotional regulation difficulties all relied on parent report, whereas self-report may have been more appropriate given the outcomes of interest were internalizing difficulties. However, parents of children with lower language may be more involved in their children's social and emotional problems as a consequence of their children's poorer conflict resolution skills (Bakopoulou & Dockrell, 2016) and therefore may be well placed to comment on their social and emotional functioning. Furthermore, the emotion regulation variable was derived from a brief set of items. Ideally, a full questionnaire measuring emotion regulation would have been used; however, this level of detail is not always possible within large population cohort studies. The measurement of emotional and peer problems, however, used the well-validated and commonly cited SDQ, allowing for comparisons with other studies. Additionally, there was only one standardized measure of language administered at one time point, necessitating the combination of naming vocabulary scores and parent report of language ability into the rDLD variable to provide a more comprehensive measure of language ability. Further analyses of the outcome measures by the individual groupings of parent report and naming vocabulary are provided in Supplemental Material S1. Overall, these limitations are a consequence of secondary data analysis, and future studies of emotion regulation designed with more control over the sample and measures are encouraged; in particular, more robust measures of language difficulties and emotion regulation could be administered to parents.

Conclusion

To the authors' knowledge, this is the first article to use a population cohort to examine the effect of early emotion regulation difficulties on later social and emotional problems in individuals with a language difficulty. The rDLD group was perceived to have poorer emotion regulation skills, more peer problems, and more emotional problems than the GP group at ages 3, 5, 7, 11, and 14 years. Cross-lagged analysis revealed different developmental pathways between variables for each group; in the rDLD group, peer and emotional problems at ages 7 and 11 years were predicted only by poor emotion regulation at ages 5 and 7 years, suggesting that early emotion regulation difficulties are having a significant effect on later social and emotional problems in children with language difficulties. Interaction effects showed the influence of age 3 years emotion regulation difficulties on age 5 years emotional problems was stronger in the rDLD group, as were relationships between early peer and emotional problems at ages 3 and 5 years. This article extends the literature surrounding emotion regulation in individuals with language difficulties and provides further evidence for the different developmental pathways to socioemotional difficulties experienced by children with and without language difficulties.

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References

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

Andrés-Roqueta, C., Adrian, J. E., Clemente, R. A., & Villanueva, L. (2016). Social cognition makes an independent contribution to peer relations in children with specific language impairment. *Research in Developmental Disabilities, 49–50,* 277–290. https://doi.org/10.1016/j.ridd.2015.12.015

Arseneault, L., Bowes, L., & Shakoor, S. (2010). Bullying victimization in youths and mental health problems: 'Much ado about nothing'? *Psychological Medicine, 40*(5), 717–729. https://doi.org/10.1017/S0033291709991383

Bakopoulou, I., & Dockrell, J. E. (2016). The role of social cognition and prosocial behaviour in relation to the socio-emotional functioning of primary aged children with specific language impairment. *Research in Developmental Disabilities, 49–50,* 354–370. https://doi.org/10.1016/j.ridd.2015.12.013

Barrett, L. F., Mesquita, B., Ochsner, K. N., & Gross, J. J. (2007). The experience of emotion. *Annual Review of Psychology, 58,* 373–403. https://doi.org/10.1146/annurev.psych.58.110405.085709

Beitchman, J. H., Wilson, B., Johnson, C. J., Atkinson, L., Young, A., Adlaf, E., Escobar, M., & Douglas, L. (2001). Fourteen-year follow-up of speech/language-impaired and control children: Psychiatric outcome. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(1), 75–82. https://doi.org/10.1097/00004583-200101000-00019

Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds. *Journal of Speech and Hearing Disorders, 52*(2), 156–173. https://doi.org/10.1044/jshd.5202.156

Bishop, D. V. M., & McDonald, D. (2009). Identifying language impairment in children: Combining language test scores with parental report. *International Journal of Language & Communication Disorders, 44*(5), 600–615. https://doi.org/10.1080/13682820802259662

Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalgh, T., & CATALISE Consortium. (2016). CATALISE: A multinational and multidisciplinary Delphi consensus study. Identifying language impairments in children. *PLOS ONE, 11*(7), e0158753. https://doi.org/10.1371/journal.pone.0158753

Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalgh, T., & CATALISE Consortium. (2017). Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology. *The Journal of Child Psychology and Psychiatry, 58*(10), 1068–1080. https://doi.org/10.1111/jcpp.12721

Botting, N., Durkin, K., Toseeb, U., Pickles, A., & Conti-Ramsden, G. (2016). Emotional health, support, and self-efficacy in young adults with a history of language impairment. *British Journal of Developmental Psychology, 34*(4), 538–554. https://doi.org/10.1111/bjdp.12148

Botting, N., Toseeb, U., Pickles, A., Durkin, K., & Conti-Ramsden, G. (2016). Depression and anxiety change from adolescence to

adulthood in individuals with and without language impairment. *PLOS ONE, 11*(7), e0156678. https://doi.org/10.1371/journal.pone.0156678

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality, 54*(1), 106–148. https://doi.org/10.1111/j.1467-6494.1986.tb00391.x

Brinton, B., Fujiki, M., Spencer, J. C., & Robinson, L. A. (1997). The ability of children with specific language impairment to access and participate in an ongoing interaction. *Journal of Speech, Language, and Hearing Research, 40*(5), 1011–1025. https://doi.org/10.1044/jslhr.4005.1011

Clegg, J., Hollis, C., Mawhood, L., & Rutter, M. (2005). Developmental language disorders—A follow-up in later adult life. Cognitive, language and psychosocial outcomes. *The Journal of Child Psychology and Psychiatry, 46*(2), 128–149. https://doi.org/10.1111/j.1469-7610.2004.00342.x

Clegg, J., Law, J., Rush, R., Peters, T. J., & Roulstone, S. (2015). The contribution of early language development to children's emotional and behavioural functioning at 6 years: An analysis of data from the children in Focus sample from the ALSPAC birth cohort. *The Journal of Child Psychology and Psychiatry, 56*(1), 67–75. https://doi.org/10.1111/jcpp.12281

Connelly, R., & Platt, L. (2014). Cohort profile: UK Millennium Cohort Study (MCS). *International Journal of Epidemiology, 43*(6), 1719–1725. https://doi.org/10.1093/ije/dyu001

Conti-Ramsden, G., & Botting, N. (1999). Characteristics of children attending language units in England: A national study of 7-year-olds. *International Journal of Language & Communication Disorders, 34*(4), 359–366. https://doi.org/10.1080/136828299247333

Conti-Ramsden, G., & Botting, N. (2008). Emotional health in adolescents with and without a history of specific language impairment (SLI). *The Journal of Child Psychology and Psychiatry, 49*(5), 516–525. https://doi.org/10.1111/j.1469-7610.2007.01858.x

Conti-Ramsden, G., Mok, P., Durkin, K., Pickles, A., Toseeb, U., Botting, N. J. E. C., & Psychiatry, A. (2018). Do emotional difficulties and peer problems occur together from childhood to adolescence? The case of children with a history of developmental language disorder (DLD). *European Child & Adolescent Psychiatry, 28*(7), 993–1004. https://doi.org/10.1007/s00787-018-1261-6

Conti-Ramsden, G., Mok, P. L. H., Pickles, A., & Durkin, K. (2013). Adolescents with a history of specific language impairment (SLI): Strengths and difficulties in social, emotional and behavioral functioning. *Research in Developmental Disabilities, 34*(11), 4161–4169. https://doi.org/10.1016/j.ridd.2013.08.043

Dennis, M., Francis, D. J., Cirino, P. T., Schachar, R., Barnes, M. A., & Fletcher, J. M. (2009). Why IQ is not a covariate in cognitive studies of neurodevelopmental disorders. *Journal of the International Neuropsychological Society, 15*(3), 331–343. https://doi.org/10.1017/S1355617709090481

Durkin, K., & Conti-Ramsden, G. (2007). Language, social behavior, and the quality of friendships in adolescents with and without a history of specific language impairment. *Child Development, 78*(5), 1441–1457. https://doi.org/10.1111/j.1467-8624.2007.01076.x

Durkin, K., Toseeb, U., Botting, N., Pickles, A., & Conti-Ramsden, G. (2017). Social confidence in early adulthood among young people with and without a history of language impairment. *Journal of Speech, Language, and Hearing Research, 60*(6), 1635–1647. https://doi.org/10.1044/2017_JSLHR-L-16-0256

Elliott, C. D., Smith, P., & McCulloch, K. (1997). *British Ability Scales–Second Edition (BAS II): Technical manual*. Nelson.

Eisenberg, N., Sadovsky, A., & Spinrad, T. L. (2005). Associations of emotion-related regulation with language skills, emotion knowledge, and academic outcomes. *New Directions for Child and Adolescent Development, 2005*(109), 109–118. https://doi.org/10.1002/cd.143

Fombonne, E. (2016). Editorial: Isolating the essential difference—The importance of choosing the right type and sufficient numbers of controls in research on neurodevelopmental disorders and mental health conditions. *The Journal of Child Psychology and Psychiatry, 57*(11), 1203–1204. https://doi.org/10.1111/jcpp.12660

Forrest, C. L., Gibson, J. L., Halligan, S. L., & St Clair, M. C. (2018). A longitudinal analysis of early language difficulty and peer problems on later emotional difficulties in adolescence: Evidence from the millennium cohort study. *Autism & Developmental Language Impairments, 3,* 2396941518795392. https://doi.org/10.1177/2396941518795392

Fujiki, M., Brinton, B., & Clarke, D. (2002). Emotion regulation in children with specific language impairment. *Language, Speech, and Hearing Services in Schools, 33*(2), 102–111. https://doi.org/10.1044/0161-1461(2002/008)

Fujiki, M., Spackman, M. P., Brinton, B., & Hall, A. (2004). The relationship of language and emotion regulation skills to reticence in children with specific language Impairment. *Journal of Speech, Language, and Hearing Research, 47*(3), 637–646. https://doi.org/10.1044/1092-4388(2004/049)

Geoffroy, M. C., Boivin, M., Arseneault, L., Renaud, J., Perret, L. C., Turecki, G., Michel, G., Salla, J., Vitaro, F., Brendgen, M., Tremblay, R. E., & Côté, S. M. (2018). Childhood trajectories of peer victimization and prediction of mental health outcomes in midadolescence: A longitudinal population-based study. *Canadian Medical Association Journal, 190*(2), E37–E43. https://doi.org/10.1503/cmaj.170219

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *The Journal of Child Psychology and Psychiatry, 38*(5), 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(11), 1337–1345. https://doi.org/10.1097/00004583-200111000-00015

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology, 39*(3), 281–291. https://doi.org/10.1017/S0048577201393198

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Brookes.

Hart, K. I., Fujiki, M., Brinton, B., & Hart, C. H. (2004). The relationship between social behavior and severity of language impairment. *Journal of Speech, Language, and Hearing Research, 47*(3), 647–662. https://doi.org/10.1044/1092-4388(2004/050)

Holodynski, M., & Friedlmeier, W. (2010). *Development of emotions and emotion regulation*. Springer Science & Business Media.

Hughes, N., Sciberras, E., & Goldfeld, S. (2016). Family and community predictors of comorbid language, socioemotional and behavior problems at school entry. *PLOS ONE, 11*(7), e0158802. https://doi.org/10.1371/journal.pone.0158802

Johnson, J., Atkinson, M., & Rosenberg, R. (Eds.). (2015). *Millennium cohort study: Psychological, developmental and health inventories* (3rd ed.). Centre for Longitudinal Studies.

Jones, P. B. (2013). Adult mental health disorders and their age at onset. *The British Journal of Psychiatry, 202*(s54), s5–s10. https://doi.org/10.1192/bjp.bp.112.119164

Ketende, S. C., & Jones, E. M. (2011). *The millennium cohort study: User guide to analysing MCS data using STATA*. Centre for Longitudinal Studies.

Kilpatrick, T., Leitão, S., & Boyes, M. (2019). Mental health in adolescents with a history of developmental language disorder: The moderating effect of bullying victimisation. *Autism & Developmental Language Impairments, 4*. https://doi.org/10.1177/2396941519893313

Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: Developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry, 60*(7), 709–717. https://doi.org/10.1001/archpsyc.60.7.709

Lemerise, E. A., & Arsenio, W. F. (2000). An integrated model of emotion processes and cognition in social information processing. *Child Development, 71*(1), 107–118. https://doi.org/10.1111/1467-8624.00124

Levickis, P., Sciberras, E., McKean, C., Conway, L., Pezic, A., Mensah, F. K., Bavin, E. L., Bretherton, L., Eadie, P., Prior, M., & Reilly, S. (2018). Language and social–emotional and behavioural wellbeing from 4 to 7 years: A community-based study. *European Child & Adolescent Psychiatry, 27*(7), 849–859. https://doi.org/10.1007/s00787-017-1079-7

Lidstone, J. S. M., Meins, E., & Fernyhough, C. (2012). Verbal mediation of cognition in children with specific language impairment. *Developmental and Psychopathology, 24*(2), 651–660. https://doi.org/10.1017/S0954579412000223

Maggio, V., Grañana, N. E., Richaudeau, A., Torres, S., Giannotti, A., & Suburo, A. M. (2014). Behavior problems in children with specific language impairment. *Journal of Child Neurology, 29*(2), 194–202. https://doi.org/10.1177/0883073813509886

McKean, C., Wraith, D., Eadie, P., Cook, F., Mensah, F., & Reilly, S. (2017). Subgroups in language trajectories from 4 to 11 years: The nature and predictors of stable, improving and decreasing language trajectory groups. *The Journal of Child Psychology and Psychiatry, 58*(10), 1081–1091. https://doi.org/10.1111/jcpp.12790

McLaughlin, K. A., Hatzenbuehler, M. L., Mennin, D. S., & Nolen-Hoeksema, S. (2011). Emotion dysregulation and adolescent psychopathology: A prospective study. *Behaviour Research and Therapy, 49*(9), 544–554. https://doi.org/10.1016/j.brat.2011.06.003

Muthén, B., & Muthén, L. (1998–2012). *Mplus user's guide* (7th ed.).

Norbury, C. F., Gooch, D., Wray, C., Baird, G., Charman, T., Simonoff, E., Vamvakas, G., & Pickles, A. (2016). The impact of nonverbal ability on prevalence and clinical presentation of language disorder: Evidence from a population study. *The Journal of Child Psychology and Psychiatry, 57*(11), 1247–1457. https://doi.org/10.1111/jcpp.12573

Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). Open University Press/McGraw-Hill.

Plewis, I., Calderwood, L., Hawkes, D., Hughes, G., & Joshi, H. (2007). *Millennium Cohort Study: Technical report on sampling*. Centre for Longitudinal Studies.

Redmond, S. M. (2011). Peer victimization among students with specific language impairment, attention-deficit/hyperactivity disorder, and typical development. *Language, Speech, and Hearing Services in Schools, 42*(4), 520–535. https://doi.org/10.1044/0161-1461(2011/10-0078)

Redmond, S. M., & Rice, M. L. (1998). The socioemotional behavios of children with SLI. *Journal of Speech, Language, and Hearing Research, 41*(3), 688–700. https://doi.org/10.1044/jslhr.4103.688

Rescorla, L., Achenbach, T. M., Ivanova, M. Y., Dumenci, L., Almqvist, F., Bilenberg, N., Bird, H., Broberg, A., Dobrean, A., Döpfner, M., Erol, N., Forns, M., Hannesdottir, H., Kanbayashi, Y., Lambert, M. C., Leung, P., Minaei, A., Mulatu, M. S., Novik, T. S., . . . Verhulst, F. (2007). Epidemiological comparisons of problems and positive qualities reported by adolescents in 24 countries. *Journal of Consulting and Clinical Psychology, 75*(2), 351–358. https://doi.org/10.1037/0022-006X.75.2.351

Silk, J. S., Steinberg, L., & Morris, A. S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Development, 74*(6), 1869–1880. https://doi.org/10.1046/j.1467-8624.2003.00643.x

Spinrad, T. L., Eisenberg, N., Cumberland, A., Fabes, R. A., Valiente, C., Shepard, S. A., Reiser, M., Losoya, S. H., & Guthrie, I. K. (2006). Relation of emotion-related regulation to children's social competence: A longitudinal study. *Emotion, 6*(3), 498–510. https://doi.org/10.1037/1528-3542.6.3.498

St Clair, M. C., Forrest, C. L., Yew, S. G. K., & Gibson, J. L. (2019). Early risk factors and emotional difficulties in children at risk of developmental language disorder: A population cohort study. *Journal of Speech, Language, and Hearing Research, 62*(8), 2750–2771. https://doi.org/10.1044/2018_JSLHR-L-18-0061

St Clair, M. C., Pickles, A., Durkin, K., & Conti-Ramsden, G. (2011). A longitudinal study of behavioral, emotional and social difficulties in individuals with a history of specific language impairment (SLI). *Journal of Communication Disorders, 44*(2), 186–199. https://doi.org/10.1016/j.jcomdis.2010.09.004

StataCorp. (2015). Stata statistical software: Release 14.

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development, 59*(2–3), 25–52. https://doi.org/10.1111/j.1540-5834.1994.tb01276.x

Tomasello, M. (2009). The usage-based theory of language acquisition. In *The Cambridge handbook of child language* (pp. 69–87). Cambridge University Press. https://doi.org/10.1017/CBO9780511576164.005

University of London, Institute of Education, Centre for Longitudinal Studies. (2017a). *Millennium cohort study: First survey, 2001–2003* [Data collection] (12th ed.). UK Data Service. SN: 4683. http://doi.org/10.5255/UKDA-SN-4683-4

University of London, Institute of Education, Centre for Longitudinal Studies. (2017b). *Millennium cohort study: Second survey, 2003–2005* [Data collection] (9th ed.). UK Data Service. SN: 5350. http://doi.org/10.5255/UKDA-SN-5350-4

University of London, Institute of Education, Centre for Longitudinal Studies. (2017c). *Millennium cohort study: Third survey, 2006* [Data collection] (7th ed.). UK Data Service. SN: 5795. http://doi.org/10.5255/UKDA-SN-5795-4

University of London, Institute of Education, Centre for Longitudinal Studies. (2017d). *Millennium cohort study: Fourth survey, 2008* [Data collection] (7th ed.). UK Data Service. SN: 6411. http://doi.org/10.5255/UKDA-SN-6411-7

University of London, Institute of Education, Centre for Longitudinal Studies. (2017e). *Millennium cohort study: Fifth survey, 2012* [Data collection] (4th ed.). UK Data Service. SN: 7464. http://doi.org/10.5255/UKDA-SN-7464-4

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). *Millennium cohort study: Sixth survey, 2015* [Data collection] (5th ed.). UK Data Service. SN: 8156. http://doi.org/10.5255/UKDA-SN-8156-5

Vallotton, C., & Ayoub, C. (2011). Use your words: The role of language in the development of toddlers' self-regulation. *Early Childhood Research Quarterly, 26*(2), 169–181. https://doi.org/10.1016/j.ecresq.2010.09.002

van den Bedem, N. P., Dockrell, J. E., van Alphen, P. M., de Rooij, M., Samson, A. C., Harjunen, E. L., & Rieffe, C. (2018). Depressive symptoms and emotion regulation strategies in children with and without developmental language disorder: A longitudinal study. *International Journal of Language & Communication Disorders, 53*(6), 1110–1123. https://doi.org/10.1111/1460-6984.12423

van den Bedem, N. P., Dockrell, J. E., van Alphen, P. M., Kalicharan, S. V., & Rieffe, C. (2018). Victimization, bullying, and emotional competence: Longitudinal associations in (pre)adolescents with and without developmental language disorder. *Journal of Speech, Language, and Hearing Research, 61*(8), 1–17. https://doi.org/10.1044/2018_JSLHR-L-17-0429

van Harmelen, A.-L., Kievit, R., Ioannidis, K., Neufeld, S., Jones, P. B., Bullmore, E., Dolan, R., The NSPN Consortium, Fonagy, P., & Goodyer, I. (2017). Adolescent friendships predict later resilient functioning across psychosocial domains in a healthy community cohort. *Psychological Medicine, 47*(13), 2312–2322. https://doi.org/10.1017/S0033291717000836

Wadman, R., Botting, N., Durkin, K., & Conti-Ramsden, G. (2011). Changes in emotional health symptoms in adolescents with specific language impairment. *International Journal of Language & Communication Disorders, 46*(6), 641–656. https://doi.org/10.1111/j.1460-6984.2011.00033.x

Yew, S. G., & O'Kearney, R. (2013). Emotional and behavioural outcomes later in childhood and adolescence for children with specific language impairments: Meta-analyses of controlled prospective studies. *The Journal of Child Psychology and Psychiatry, 54*(5), 516–524. https://doi.org/10.1111/jcpp.12009