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# Effects of Positive Parenting on Mental Health in Adolescents with Learning Disabilities

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*There is a notable overlap and co-occurrence of mental health and learning challenges in adolescence. Existing research highlights associations between learning disabilities and mental health problems; however, limited research explores additional variables, such as familial influences. Using a developmental relational systems framework, this research advances understandings of the influences of positive parenting on adolescents with learning disabilities. Secondary data analysis of the National Longitudinal Survey of Children and Youth was used to explore direct and indirect effects of parental depression, family functioning, parental nurturing and monitoring behaviours, adolescent social and emotional competencies on adolescent mental health. Adolescent social and emotional competencies and parental monitoring were strong significant mediators in reducing symptoms of anxiety and depression among youth with learning disabilities. Theoretical and practical implications related to ecological resilience and positive parenting are explored.*

***Keywords:*** **mental health problems, adolescents, learning disabilities, parenting, path analyses**

## Introduction

There is substantial longitudinal evidence of the association between adolescents emotional and behavioural health and their learning and achievement (Darney, Reinke, Herman, Stormont, & Ialongo, 2013; Valdez, Lambert, & Ialongo, 2011). Across the lifespan, having a learning disability (LD) increases the risk for mental health problems as evidence indicates elevated self-reported symptoms of anxiety and depression in children, adolescents, and adults (Maag & Reid, 2006; Wilson, Armstrong, Furrie, & Walcot, 2009). While there are increasing rates of mental health problems generally among children and adolescents (e.g., Collinshaw, Maughan, Natarajan, & Pickles, 2010; Mental Health Commission of Canada, 2017; Sweeting, West, Young, & Der, 2010), the co-occurrence of LD and intractable educational difficulties in and outside the school context presents an added risk factor (Mather & Ofiesh, 2006). From the school context, extant research has examined the predictors of mental health concerns in children and adolescents with LD, but much less research has been conducted within the context of the family, especially the influence of parenting behaviours on mental health outcomes for adolescents with LD. Protective factors such as positive parenting behaviours, including nurturing (e.g., warmth, listening, appreciation, pride) and monitoring (e.g., knowledge of daily activities,

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friendships, behaviours, and establishing curfews) have been found to be essential for adolescents with LD mitigating the potential strain on parental resources, attachment systems, and adolescent self-concept (Majorano, Brondino, Morelli, & Maes, 2017; Tabak & Zawadzka, 2017). Drawing on a *relational developmental systems* account (Overton, 2015), our aim in the present study was to explore the association between LD and mental health problems, specifically examining symptoms of internalizing problems related to anxiety and depression among adolescents and the anticipated mediating role of family factors. We refer to "internalizing problems" as indicators of anxiety and depression (e.g., Achenbach & Edelbrock, 1978; Zahn-Waxler, Klimes-Dougan & Slattery, 2000) and "internalized distress" - a term often used on rating scales such as the scales used in the current study - as an elevated endorsement of symptoms across anxiety and depression.

The *relational developmental systems* framework conceptually emphasizes mutually influential individual and contextual relations. Research situated in this framework seeks to understand the broader factors that refocus development in context. This coactional approach, also consistent with a social-ecological resilience model (e.g., Rutter, 2006; Ungar, 2012) elucidates the relational influences (i.e., person-process-context) that are believed to positively contribute to adolescent development despite adverse conditions. Thus, research from this perspective seeks to recognize the individual, family, community, and system levels of influence. In keeping with this account, we aimed to increase understanding beyond the individual level of influence to the family and parenting behaviour in particular, and the effects on the co-occurrence of anxiety and depression in adolescents with LD.

An overarching goal of developmental research is to identify the individual and ecological conditions that reflect *resilience* (Lerner, Arbeit, Agans, Alberts, and Warren 2013). Resilience represents the many ways in which individuals adapt successfully to adversity (Egeland, Carlson, & Sroufe, 1993; Wright & Masten, 2015) and has been defined as "stressful life experiences that threaten adaptation or development" (Wright & Masten, 2015, p. 6). LD and mental health problems may be considered stressors that potentially compromise a child or adolescent's positive adaptation. Psychosocial resources and parenting quality have been historically examined as potential contributors to resilient outcomes (e.g., Masten, Hubbard, Gest, Tellegen, Garmazy, & Ramirez, 1999). In the present study, we examine the influences of social-emotional competencies and family factors on internalizing problems in adolescents with LD.

***Co-occurrence of LD and Internalizing Problems***

Many adolescents with co-occurring LDs and internalizing problems have school failure experiences that negatively influence confidence (Mather & Ofiesh, 2006). Negative cycles can be set in motion whereby the individual believes that things will not improve, and this sense of hopelessness becomes a barrier to future successes. Mather and Ofiesh (2006) suggest that when children and adolescents are not reinforced through positive academic and social experiences, they have a depleted store of emotional resources to withstand failure. Repeated failed attempts at mastering academic tasks can lead to feelings of frustration, further exacerbating,

or generating, emotional, behavioural, and learning challenges resulting in cumulative risk. These unresolved risk factors impact the functioning of the family system. Masten et al.'s (1999) longitudinal study highlighted the unique role of parenting in adolescence, demonstrating that parenting in childhood predicted social competence in adolescence (more than parenting in adolescence) and that parents changed their parenting to influence competence in their adolescent. These results highlight that children and adolescents influence the quality of their resources and that these coactional processes are of utmost importance to the study of development. Familial influences are less frequently explored in the literature on children and adolescents with LD. Familial influences such as increased levels of parental stress (Bonifacci, Storti, Tobia, & Suardi, 2016) and family functioning difficulties (Al-Yagon, 2016) have been documented among parents of adolescents with LD and are central issues that were closely explored in the current study.

Commonly comorbid, anxiety and depression are the most common mental health problems in adolescence and are often assessed together (Costello, Egger, & Angold, 2005; Weeks et al., 2014). For students with LD in kindergarten through grade 12, Nelson and Harwood's (2011) meta-analysis demonstrated an overall significant effect size of medium magnitude ($d$=.61) on measures of anxiety, whereas Maag and Reid's (2006) meta-analysis demonstrated an overall significant effect size of small to moderate magnitude ($d$=.35) on measures of depression. Both depressive and anxious symptomology among students with LD is higher than among their peers without learning disabilities; however, results do not necessarily indicate that these students experience clinically significant symptomology (Maag & Reid, 2006; Nelson & Harwood, 2011). Among students in first grade to university level, Mugnaini and colleagues (2009) reported medium to large effect sizes or odds ratios for 11 studies that confirmed dyslexia as a specific risk factor for increased anxious and depressive symptoms. Likewise, Willcutt and Pennington's (2000) study of 8- to 18-year-old twins ($n$ = 209 individuals with LD, $n$ = 192 individuals without LD in community control sample) found that reading disorders were significantly associated with depressive symptoms. In their study, individuals with reading disabilities were more likely to meet diagnostic criteria for anxiety and depressive disorders. In other studies, consistent with findings in childhood research, females reported significantly more symptoms of depression compared to males with reading disabilities (Graefen et al., 2015; Martinez & Semrud-Clikeman, 2004). Feurer and Andrews (2009) and Howard and Shick Tyron (2002) studied school-related variables among students aged 13 to 19 years. Feurer and Andrews (2009) examined the association between school-related stress and depression among adolescents with LD. School-related stress variables included peer interaction, teacher interaction, and academic self-concept measures. Academic self-concept referred to students' perceptions of their academic abilities and performance. Feurer and Andrews' (2009) results indicated that adolescents in the LD group experienced higher levels of academic self-concept stress, compared to a non-LD group. However, both groups reported elevated levels of depression (moderate to severe levels) as measured on the Beck Depression Inventory-2nd Edition (BDI-II; Beck, Steer & Brown, 1996).

***Family Factors***

Bonifacci and colleagues' (2016) preliminary study assessing possible emotional and behavioural correlates of LD within the family system demonstrated that parents of children with LD exhibited higher levels of parental distress. Up to 75% of families with a child with LD considered the child's LD to exert a negative effect on family life, and mothers reported elevated symptoms of anxiety and depression (Karande, Kumbhare, Kulkarni, & Shah, 2009; Snowling, Mutter, & Carroll, 2007). Mothers of children with LD tend to have high levels of avoidant coping (Al-Yagon, 2015), and both parents tend to experience higher levels of distress (Beardslee et al., 2011; Bonifacci et al., 2016), compared to families of typically developing children without LD. Van Loon et al. (2014) found that parents with a mental health diagnosis reported significantly less family cohesion and expressiveness and more conflict in the family system, compared to parents without a mental illness. Indeed, positive parenting and family functioning may protect against the negative impact of parental depression on children's health and development (Letourneau et al., 2013). Positive parenting, specifically parents' praising behaviour in relation to both early and late adolescents, has been found to be directly linked to better mental health outcomes (Tabak & Zawadzka, 2017). Existing research demonstrates adolescents with LD are more sensitive than their peers without LD to the quality of parental resources such as positive affect and attachment systems (Al-Yagon, 2011). Majorano et al., (2017) posit that positive parenting behaviours are crucial protective factors for adolescents with LD because the presence of LD intensifies the association among parent-adolescent relationship qualities as well as adolescents' experience of loneliness and low self-concept.

Masten et al.'s (1999) longitudinal evidence indicates well-functioning parent-child relationships are important for overcoming cumulative adversities and hold a general developmental advantage. Letourneau, Salmani, and Duffett-Leger's (2010) results highlight family functioning as powerful predictors of parental warmth and nurturance. Bonifacci et al. (2016) speculate having a child with LD has a significant impact on the parent's role. For example, parents may find it difficult to establish a routine of discipline (Bonifacci et al., 2016). Van Loon et al. (2014) found a direct relation between parental mental illness and adolescent internalizing problems, with only parental monitoring (out of the five selected family factors) mediating this relation. Adolescents' reports of parental monitoring and support have been linked to positive outcomes under high-risk situations (Egeland et al., 1993). Letourneau et al.'s (2010) longitudinal findings of children from birth to age 12 suggest that mothers with symptoms of depression report less warm and nurturing parenting than mothers who are not symptomatically depressed. Al-Yagon's (2012) study of high school students with LD found less secure relationships with mothers (but not with fathers) compared to non-LD students. More research is needed to better understand parenting influences on the co-occurrence of LD and mental health concerns, especially in adolescents who have been understudied in existing the literature.

## Current Study

Our study examined the direct and indirect influences of family factors including parent symptoms of depression, family functioning, and positive parenting

behaviours on internalized distress in 14 to 15-year-old adolescents formally diagnosed with LD and is one of the first investigations from a relational developmental systems perspective based on a large national data set using the Canadian National Longitudinal Survey of Children and Youth (NLSCY; Statistics Canada, 2008). Based on the corpus of research to date, we hypothesized that: (1) Parental depression, parental monitoring/nurturing behaviours, family functioning, and adolescent social and emotional competencies will significantly predict internalized distress among adolescents with LD, and (2) Parental monitoring/nurturing behaviours, family functioning, and adolescent social and emotional competencies will significantly mediate the relation between parental depression and internalized distress among adolescents with LD. We tested these assumptions through a series of regression analyses.

## Method

Cross-sectional data from Cycle 8 of the NLSCY was analysed. The survey began in 1994 and included eight cycles until 2008 to address the following objectives (1) to determine the prevalence of various risk and protective factors for children and youth; (2) to understand how these factors, as well as life events, influence children's development; (3) to collect information on a wide variety of topics including social, biological, and economic issues; (4) to collect information about the environment in which the child is growing up; (5) and to make information available for developing policies and programs that will help children and youth (Statistics Canada, 2008, p.13). Children in the NLSCY were selected from households sampled by Canada's Labour Force Survey. Collection of the first cycle of the NLSCY began with one large cohort of children aged 11 years and younger who lived in all provinces in Canada. The sample of children selected at Cycle 1 (i.e., 1994) was designed to produce reliable provincial estimates. In Cycle 1 22,831 children were sampled with 86.5% response rate. By Cycle 8 (i.e., 2008), 15,056 children responded when surveyed and the longitudinal response rate in the original cohort was 52.7%. By Cycle 8, the dataset used in the present study, respondents were between 14 and 25 years old. Given the large representative sample, and the comprehensiveness of the measures included at the individual (adolescent) and family levels, the NLSCY provided a valuable source of data beyond that possible with primary data collection (e.g., Pienta et al., 2011).

### *Participants*

We focused our analysis on the sample of adolescents aged 14 and 15 years old from the Cycle 8 survey. This age range was selected because anxiety and depression are most prevalent during this time in adolescence with estimates of up 30% of adolescents eligible for a diagnosable anxiety disorder (Kessler et al., 2012; Merikangas et al., 2010, Wilson et al., 2009) and because of the increasing levels of stress during highschool (e.g., Feurer & Andrews, 2009; Mychailyszyn, Mendez, & Kendall, 2010). Our sample, weighted to reflect population parameters, indicated that about 5.9% of 14 and 15-year-olds ($n$ = 56,907) had a health professional diagnose a learning disability (i.e., specific learning disorder based on DSM-IV TR criteria) as reported by the parent respondent and most of this subgroup (94%) had school-based special education designations. The mean age of participants was 14.47 ($SD$ = .49) and 41% were female. In this subsample of adolescents with LD, all (100%)

were born in Canada, which reflected the lack of immigrant top-up at this cycle of the survey. Children primarily lived in urban areas of over 100,000 (53%) and 23% of children resided in rural areas (< 30,000 population). Adolescent participants reported on their parents' parenting behaviours and self-reported on social-emotional functioning.

Parental reports based on the "parent most knowledgeable" were also collected (91% mothers; mean age = 43.30, *SD* = 5.34). Over half (57%) of the parents and 45% of spouses held certification or degree from a post-secondary institution (including trades, college, and university) and 83% of parents were currently employed. Most adolescents (76.5%) lived in a two-parent home with a mean household income of $86,959 (*SD* = $58,128). Parents completed questionnaires on parenting, family relationships, family communication and self-report measures on their personal depressive symptoms. Inclusion criteria required the adolescents and their parent to have completed the selected measures described below, no other exclusion criteria were used. Applying these criteria reflected a *weighted* sample of *n* = 24,915 adolescents and their parent respondent.

***Measures***

From the available parent and adolescent data in NLSCY Cycle 8, several individual and family measures were used. NLSCY variables have been subjected to extensive reliability and validity assessment and judged to be acceptable to respondents for over nearly two decades of data collection. Table 1 summarizes the number of items and internal consistency estimates across all measures.

**Adolescent-reported scales.** ***Behaviour scale.*** The emotional disorder – anxiety subscale data, assessing symptoms of internalized distress, was used because the factors assessed on this measure represent anxious and depressive symptoms. Although individuals may not meet diagnostic criteria for an emotional disorder, "subthreshold internalizing symptoms" have been identified as developmental risk factors (Weeks et al., 2014, p. 609). The scale included seven questions. ***Emotional Quotient (4 factor) scale.*** The emotional quotient scale was selected because the factors assessed by this measure are closely related to social and emotional competencies. Developed by Bar-On and Parker (2000) the Emotional Quotient Inventory Youth Version (EQ-i; YV) measures "emotional intelligence." The EQ-i:YV is a self-report measure of emotion and social abilities that provides an estimate of emotional-social intelligence (Bar-On, 2006). The measure is comprised of four major dimensions: intrapersonal (e.g., self-regard, self-awareness, assertiveness, independence); interpersonal (e.g., empathy, social responsibility, relationships); stress management (e.g., comprising stress tolerance and impulse control); and adaptability (e.g., problem-solving and flexibility). The shortened version of the EQ-i; YV included 12 questions addressing respondent's social, personal, and emotional abilities (as opposed to their behaviours). ***Parents and Me scale.*** This scale was developed by Lempers, Clark-Lempers, and Simmons (1989) and complements the NLSCY parent-reported family functioning survey by gathering information from children regarding their perceptions of their relationships with parents. This scale

included 18 questions measuring subscales of parental nurturance, rejection, and monitoring. Monitoring and nurturance subscales were used as they relate to positive parenting.

**Table 1.** ***Summary of Selected Measures***

| *Construct* | *Measure* | *Abbreviation* | *Number of Questions* | *Possible Range* | *Mean* | *SD* | α |
|---|---|---|---|---|---|---|---|
| Internalized Distress | Behaviour Scale, Emotional Disorder-Anxiety Subscale, Adolescent Reported | Distress | 7 | 0 to 21 | 2.64 | 2.62 | .81 |
| Social-Emotional Competencies | Emotional Quotient (4 factor), Adolescent Reported | Social-Emotional | 12 | 0 to 36 | 21.94 | 5.06 | .70 |
| Family Functioning | Family Functioning, Parent Reported | Family | 12 | 0 to 36 | 26.28 | 4.42 | .92 |
| Parenting Behaviour | Parents and Me, Monitoring Subscale, Adolescent Reported | Monitoring | 5 | 0 to 25 | 14.34 | 3.18 | .41 |
| Parenting Behaviour | Parents and Me, Nurturance Subscale, Adolescent Reported | Nurturance | 5 | 0 to 25 | 22.10 | 4.81 | .91 |
| Parental Depression | CES-D, Short Version, Parent Reported | Depression | 12 | 0 to 36 | 4.00 | 4.77 | .85 |

**Parent-reported scales.** ***Depression scale.*** A shorter version of the Centre of Epidemiological Studies Depression scale (CES-D scale; Radloff, 1977) was administered to the parent most knowledgeable as part of the NLSCY Parent

Questionnaire. Reduced to 12 questions, the aim of the scale is to gather information about the mental health of respondents, with particular emphasis on the severity of symptoms associated with depression during the previous week. The depression scale was selected because previous research has demonstrated parental depression can negatively impact child development and parenting behaviours (Beardslee et al., 2011; Letourneau et al., 2013). ***Family functioning scale.*** Developed by researchers at McMaster University (Statistics Canada, 2008), this scale measures problem-solving, communications, roles, affect involvement, affective responsiveness and behaviour control related to family functioning. The scale includes 12 questions and aims to provide a global assessment of family functioning and an indication of the quality of the relationships between parents and their child. The family functioning scale was selected because the relationship between children and their parents has a considerable effect on children.

***Data Analysis Approach***

Due to the longitudinal nature of NLSCY, the distribution of missing and not missing data of the LD group on each of the selected measures was compared using Levene's test of equality of variances statistic. The non-significant result ($p$>.05) allowed for the application of a complete-case analysis method using the participants who completed each of the selected measures. The path analysis was developed using regression models to determine direct effects and Sobel tests were used to test the significance of the mediating effects. In mediation models, the total effect is the sum of direct effect and indirect effects. The regression coefficients reported in the model are all standardized. The $R^2$ is used to calculate the paths disturbances on Adolescent Distress. The NLSCY provides population weights for the selected measures used in this study, and these were used in all analyses. Wuensch (2015) suggests that when working with large sample sizes even trivially small coefficients may be significant hence including a "meaningfulness" criterion and a minimum absolute value for retention is recommended. For the purposes of this study, the minimum absolute value of .10 was selected for the meaningfulness criterion as this also represents a small effect (Cohen, 1988).

**Path analyses.** The first step in path analysis was to develop the model based on theory, previous research, time precedence, and logic (Keith, 2015). A *recursive* model signals that paths (i.e., suggested causes) go in one direction and the term *cause*, in path modelling, implies weak causal ordering (Keith, 2015). According to Keith (2015), weak causal ordering means that the path from family functioning to internalized distress, for example, does not assert that family functioning directly causes internalized distress but that if family functioning and internalized distress are causally related then the direction of causality is in the direction of the arrows. The *a priori* model is based on weak causal ordering (Keith, 2015) guided by ecological developmental theory and existing research. Ecological approaches, specifically resilience models, consistently include variables reflecting social and emotional factors, while relational developmental systems approach to research on child and adolescent mental health justify the exploration of the influences of parents' mental health and parenting practices on internalized distress in adolescence. Time precedence and previous research justify the paths from Parental Depression to each

subsequent variable in the model. There is ample evidence that parent's symptoms of depression may affect many aspects of the family including parenting behaviours and family relationships (from Parental Monitoring/Nurturance to Family Functioning). The relationship between children and their parents, and parenting practices (Family Functioning, Parental Monitoring/Nurturance) may, in turn, affect the child's social and emotional competencies, including the children's level of independence, empathy, stress tolerance, assertiveness, and adaptability (Social-Emotional). Two models were generated, the first model included Parental Monitoring and then a second model included Parental Nurturing.

## Results

Secondary data analyses of the NLSCY at Cycle 8 indicated an association between LD and "emotional or psychological difficulty" diagnoses from a health professional ($\varphi$=.244, $df$=1, $p$<.001) among 14 and 15 year old adolescents, indicating that 36.3% of adolescents with emotional or psychological difficulties also have been diagnosed with LD. Wilson et al. (2009) stated that "diagnosed by a health professional" is a stronger description than a question asking "does the respondent have LD" and argues that using Statistics Canada survey data represents a unique opportunity to examine national population statistics. This initial investigation into the association between LD and mental health problems was followed by the examination of the central hypotheses of the study to gain insight into the mediating influences specifically related to adolescents with LD in a family context.

### *Solved Path Model Demonstrating Mediating Links to Adolescent Distress*

Path analysis focused on predictors of internalized distress as self-reported by adolescents with LD. Parents' symptoms of depression, adolescents' ratings of parental monitoring/nurturing, parents' ratings of family relationships, and adolescents' self-report of social and emotional competencies were configured into the two solved path models. Conceptually and statistically, the model does not include all influences on Parental Monitoring/Nurturing, Family Functioning, Social-Emotional, or Adolescent Distress variables. These path models also include "disturbances," which signifies the unmeasured variables. The $R^2$ is used to calculate the disturbance on each variable ($\sqrt{1- R^2}$).

***Path Models***

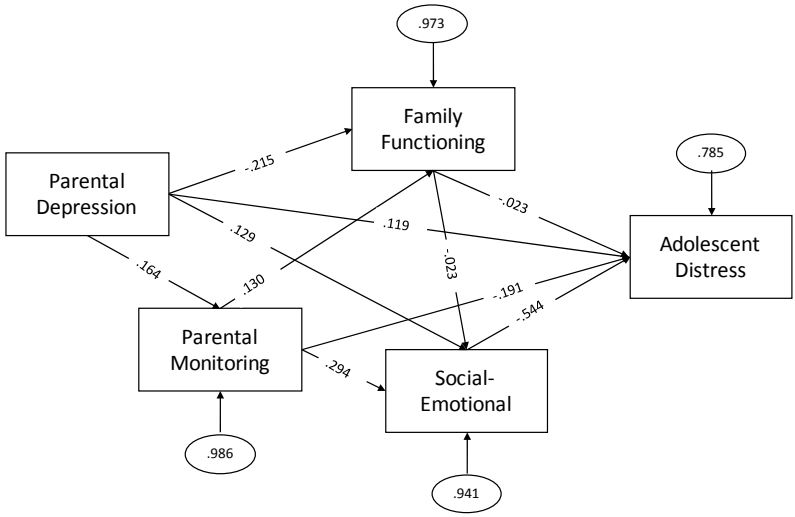


***Figure 1.*** **Parental monitoring path model 1 with the standardized path coefficients and disturbances.**

**Table 2.** ***Simultaneous Multiple Regression with Social-Emotional, Family Functioning, Parental Monitoring, and Parental Depression***

| | Predictor Variable Standardized Beta | | | | | |
|---|---|---|---|---|---|---|
| Variable | Social-Emotional | Family | Monitoring | Depression | *F* | $R^2$ |
| Distress | -.544* | -.023* | -.191* | .119* | 3870.805 | .383 |
| Social-Emotional | | -.023* | .294* | .129* | 1079.046 | .115 |
| Family | | | .130* | -.215* | 714.761 | .054 |
| Monitoring | | | | .164* | 693.956 | .027 |

Note. *p<.001

The Parental Monitoring Model 1 (Parental Depression, Parental Monitoring, Family Functioning, and Social-Emotional jointly predicted Adolescent Distress, $F(4, 24915)=3870.801$, $p=.001$, adjusted $R^2=.383$) is presented in Figure 1 and summarized in Table 2. In this model, Social-Emotional was a statistically significant predictor (β=-.544, unstandardized regression coefficient =-.284 with a standard error of .003, $t$=-102.911, $p$=.001), but Family Functioning was not a meaningful predictor (β=-.023, unstandardized regression coefficient =-.013 with a standard error of .003, $t$=-4.431, $p$=.001). Parental Monitoring was a significant predictor (β=-.191, unstandardized regression coefficient =-.157 with a standard error of .004,

*t*=-35.981, *p*=.000) and Parental Depression was also a significant predictor (β=-.119, unstandardized regression coefficient =.066 with a standard error of .003, *t*=22.917, *p*=.001).

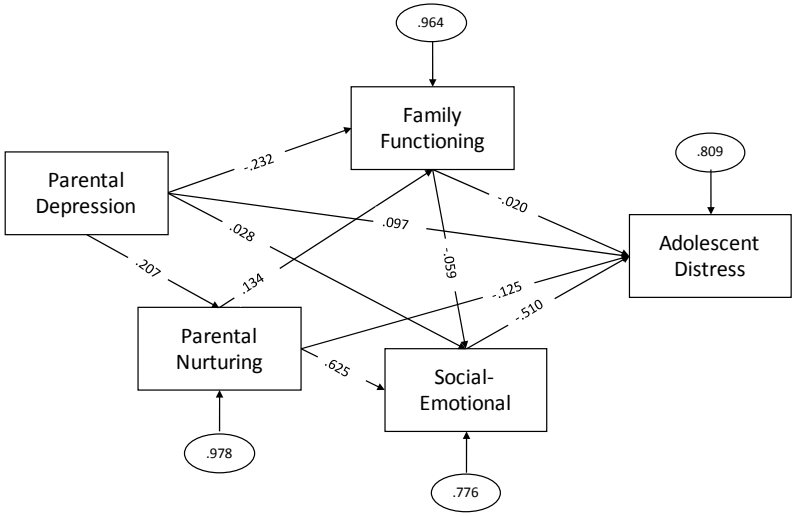


***Figure 2.*** **Parental nurturing path model 2 with the standardized path coefficients and disturbances.**

**Table 3.** ***Simultaneous Multiple Regression with Social-Emotional, Family Functioning, Parental Nurturing, and Parent Depression***

| | Predictor Variable Standardized Beta | | | | | |
|---|---|---|---|---|---|---|
| Variable | Social-Emotional | Family | Nurturing | Depression | *F* | $R^2$ |
| Distress | -.510* | -.020* | -.125* | .119* | 3227.080 | .383 |
| Social-Emotional | | -.059* | .625* | 028* | 5375.457 | .397 |
| Family | | | .134* | -.232* | 771.994 | .059 |
| Nurturing | | | | .207* | 1111.768 | .043 |

*Note*. *$p$<.001

The Parental Nurturing Model 2 (Parent Depression, Parental Nurturing, Family Functioning, and Social-Emotional jointly predicted Adolescent Distress, $F(4, 24538)=3227.080$, $p$=.001, adjusted $R^2$=.345) is presented in Figure 2 and summarized in Table 3. In this model, Social-Emotional the largest statistically significant predictor (β=-.510, unstandardized regression coefficient =-.262 with a standardized error of .003, *t*=-76.609, *p*=.001) and Family Functioning was the smallest predictor (β=-.020, unstandardized regression coefficient =-.012 with a standard error of .003, *t*=-3.695,

*p*=.001). Parental Nurturing was a significant predictor (β=-.125, unstandardized regression coefficient =-.068 with a standardized error of .003, *t*=-17.842, *p*=.001) and Parental Depression was also a significant predictor (β=.097, unstandardized regression coefficient =.053 with a standard error of .003, *t*=17.842, *p*=.001).

**Indirect and Total Effects.** Results from the regression analyses provide information to calculate the *indirect* and *total effects* of Parental Depression, Parental Monitoring/Nurturing, Family Functioning, and Social-Emotional on Adolescent Distress. One of the benefits of path analysis over simultaneous regression is that it allows for the calculation of *indirect* and *total effects* on the outcome variable in addition to *direct effects.*

***Table 4. Standardized Direct, Indirect, and Total Effects for Each Variable on Adolescent Distress***

| Variable | Direct Effect | Indirect Effect | Total Effect |
|---|---|---|---|
| Social-Emotional | -.544 | - | -.544 |
| Family | -.023 | .013* | -.010 |
| Monitoring | -.191 | -.161* | -.352 |
| Depression | .119 | -.065* | .054 |

*Note.* **p*<.001 Sobel Test (see Table 5)

The Parental Monitoring Model (see Table 4) illustrates Social-Emotional had a medium total effect of -.544 on Adolescent Distress. Family Functioning had almost no indirect effects (.013) or total effects (-.010) on Adolescent Distress. Parental Monitoring had small indirect effects of -.161 and small total effects of -.352 on Adolescent Distress. Parental Depression had very small indirect (-.065) and total effects (.054) on Adolescent Distress. Baron and Kenny's (1986) causal steps model states when the beta weight for the basic relation decreases when the mediator variable is included in the regression equation then mediation is assumed. Jose (2013) suggests *significant mediation* is obtained when the Sobel value is significant, but the basic relationship is not reduced to zero. Following this advice, the Sobel test was used to determine the significance of the indirect effects (Jose, 2013). Using the unstandardized regression coefficients and the standard errors from the regression outputs the Sobel z-value and then the converted p-value was computed for each variable using an online interactive calculation tool for mediation tests (Preacher & Leonardelli, 2018).

**Table 5.** ***Sobel Test Statistics for Significant Mediation, Adolescent Distress as Outcome Variable***

| IV | DV | Mediator | Test Statistic | *p* value |
|---|---|---|---|---|
| Family | Distress | Social-emotional | 3.711 | <.001 |
| Monitoring | Distress | Social-emotional | 41.591 | <.001 |
| Depression | Distress | Social-emotional | 19.031 | <.001 |
| Monitoring | Distress | Family | 4.235 | <.001 |
| Depression | Distress | Family | 4.297 | <.001 |
| Depression | Distress | Monitoring | 22.389 | <.001 |

Table 5 displays the results with Adolescent Distress as the outcome variable for each possible mediator in the Monitoring model. The *size* of the *indirect effects* of the mediated predictors can be measured in several different ways. The ratio of the indirect effect to the total effect based on the standardized regression coefficients signifies the size of the indirect effect (Jose, 2013). The Parental Monitoring variable was found to have 46% of the total effect mediated. This suggests that the path through Monitoring as the mediating variable accounted for almost half of the basic relation between Parental Depression and Adolescent Distress. Family Functioning and Parental Depression variables were found to have "inconsistent mediation" due to the opposite signs of the direct and indirect effects; this results in no meaningful calculation of the size of indirect effects. MacKinnon, Fairchild, and Fritz (2007) state inconsistent mediation is most common in multiple mediator models with mediating effects that have different effects and, while the direct relation may be non-significant, mediation can still exist.

**Table 6.** ***Standardized Direct, Indirect, and Total Effects for Each Variable on Adolescent Distress***

| Variable | Direct Effect | Indirect Effect | Total Effect |
|---|---|---|---|
| Social-Emotional | -.510 | - | -.510* |
| Family | -.020 | .030 | .010* |
| Nurturing | -.125 | -.317 | -.442* |
| Depression | .097 | -.043 | .054* |

*Notes*. **p*<.001 Sobel Test (see Table 7)

The Parental Nurturing Model illustrates Social-Emotional had a large total effect of -.510 on Adolescent Distress (see Table 6). Family Functioning had almost no indirect effects (.030) or total effects (.010) on Adolescent Distress. Parental Nurturing had moderate indirect effects of -.317 and total effect of -.442 on Adolescent Distress. Parental Depression had very small indirect effects (-.043) or total effects (.054) on Adolescent Distress. Table 7 displays the results with Adolescent Distress as the outcome variable for each possible mediator in the Nurturing Model. The Parental Nurturing variable was also found to have 72% of the total effect mediated.

This suggests that the path through Nurturing as the mediating variable accounted for almost 75% of the basic relation between Parental Depression and Adolescent Distress. Family Functioning and Parental Depression variables were found to have "inconsistent mediation" due to the opposite signs of the direct and indirect effects, this results in no meaningful calculation of the size of indirect effects.

**Table 7.** ***Sobel Test Statistics for Significant Mediation, Adolescent Distress as Outcome Variable***

| IV | DV | Mediator | Test Statistic | *p* value |
|---|---|---|---|---|
| Family | Distress | Social-Emotional | 11.239 | <.001 |
| Nurturing | Distress | Social-Emotional | -72.935 | <.001 |
| Depression | Distress | Social-Emotional | -4.991 | <.001 |
| Nurturing | Distress | Family | -3.927 | <.001 |
| Depression | Distress | Family | 3.975 | <.001 |
| Depression | Distress | Nurturing | -15.263 | <.001 |

## Discussion

Situated within a *relational developmental systems* account, we tested two path models to examine associations between LD and mental health problems in adolescents, and the influence of family factors including positive parenting. Drawing on a large national data set, factors examined (1) social and emotional competencies linked to internalized distress; (2) family functioning in links between internalized distress and social-emotional competencies; (3) parental monitoring and parental nurturing in links between internalized distress and social-emotional competencies and family functioning and; (4) parental depression in links between internalized distress and social-emotional competencies, family functioning, and parental monitoring/nurturing. We discuss the findings across each of these factors.

Consistent with the hypothesis one of this study, ratings of social and emotional competencies, using the Adolescent Emotional Quotient measure, were found to predict symptoms of internalized distress among adolescents with LD. The more adolescents perceived themselves to have well-developed emotional and social capacities, the fewer symptoms of internalized distress reported. Based on the Bar-On model (Bar-On, 2006), social and emotional competencies were assessed on four dimensions (intrapersonal, interpersonal, stress management, and adaptability) with "emotional intelligence" conceptualized as successful handling of personal, social, and environmental change by adapting to the current conditions, solving problems, and making decisions. Our results align with other adolescent-based research on the associations between emotional intelligence and internalizing problems (Davis & Humphrey, 2012; Downey, Johnson, Hansen, Birney & Stough, 2010), but few studies to date with adolescents have used the EQ-i (Bar-On & Parker, 2000). An exception is a study by Zavala and Lopez (2012), who reported adolescents' ratings on the intrapersonal subscale of the EQ-i significantly predicted symptoms of depression, yet were unrelated to symptoms anxiety. Reiff, Hatzes, Bramel, and Gibbon (2001) examined

emotional intelligence using the EQ-i with a group of 128 college students and found significant difference on the stress management and adaptability subscales between LD and without LD students. Results from Resurreccion et al.'s (2014) systematic review focused on emotional intelligence and various psychological maladjustment variables in adolescence; they determined that well developed emotional intelligence was associated with lower psychological maladjustment. Specifically, adolescents with higher total scores on emotional intelligence measures demonstrated better emotional adjustment, less perceived stress, and fewer symptoms of depression and anxiety (Resurreccion et al., 2014). Our findings align with these results.

We also found that the measure of family functioning failed to capture the influence of family relationships on adolescent internalized distress. From the parent's perspective, this measure assessed family behaviours such as problem-solving, communication, and affect involvement. Although Family Functioning was a significant mediator as tested by Sobel statistic, we were unable to capture the magnitude of the mediating effect due to inconsistent mediation (i.e., to the opposite signs of the beta values). Thus, contrary to the hypotheses that Family Functioning would meaningfully mediate Adolescent Distress, Family Functioning had almost no direct or mediating effects on symptoms of internalized distress among adolescents with LD. It is noteworthy that Van Loon et al. (2014) also found no direct relations between family factors, such as parent-child interaction and family environment measures and internalizing problems among adolescents who had a parent with a mental health diagnosis. Additional scales and interview methods may provide more accurate and specific information about the influence of family behaviours such as problem-solving, communication, emotional involvement and family relationships on adolescent internalized distress. Pedersen and Revenson's (2005) ecological review including family functioning and adolescent well-being found differences among the children's, mothers', and fathers' reports of family functioning, suggesting that each individual views the family environment differently. Burk and Laursen (2010) suggest stronger effects from studies with the same rater (rather than multiple raters as in our study) for each measure. The Family Functioning measure was completed by parents and the outcome measure of adolescent internalized distress was completed by the adolescent themselves. Bögels and Brechman-Toussaint (2006) suggest only a few studies have been conducted on the role of the dimensions of family functioning in the maintenance of child mental health problems; these authors maintain this is due to confusion on theoretical conceptions in family theory and the lack of a well-defined model which articulates the types of family functioning related to mental health problems.

Positive parenting, specifically monitoring behaviours, was one of the measures in the current study from adolescent's perspectives. The adolescent-reported Parental Monitoring measure complemented the parent-reported Family Functioning measure by gathering information from adolescents about their perceptions of parenting behaviours. Consistent with previous research (e.g., Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007; Jacobson & Crocket, 2000), we found the more adolescents perceived their parent to have knowledge and interest in their activities, the fewer symptoms of internalized distress they reported. Parental monitoring is often operationalized as parents' knowledge of adolescent's daily activities (Crouter &

Head, 2002). According to Stattin and Kerr (2000), the monitoring construct should include not only parent effort to find out what children are doing outside the home, but also the child's unprompted willingness to communicate information with their parent(s). Importantly, a focus on the adolescent's point of view is required in assessing parents' knowledge of activities (Stattin & Kerr, 2000). Parental monitoring is also related to positive adjustment and relationships with parents (e.g., Jacobson & Crockett, 2000), and based on extant research, parental monitoring is related to fewer adolescents behaviours of concerns, such as drug use and delinquency (e.g., see Crouter and Head, 2002 for review). Likewise, research drawing on two earlier cycles of the NLSCY data reported monitoring, rejection, and nurturance parenting behaviours mediated maladjustment in 10- to 15-year olds (Elgar et al., 2007) and our findings are consistent with these results. Parental monitoring behaviours typically decline in adolescence as parents acknowledge an increased need for adolescents' autonomy (Jacobson & Crockett, 2000; Spera, 2006), thus more research is needed to understand the balance of monitoring behaviours required in adolescence, for adolescents with co-occurring LD and mental health problems, as our findings suggest the monitoring construct remains of utmost importance in middle adolescence. Additionally, more research on the elements of the parent-child relationship that lead to children's disclosure of information is warranted (Kerr, Stattin, & Burk, 2010). Our results suggest that adolescents' perceptions of their parents knowing and taking interest in their day-to-day activities are associated with increased personal perceptions of intrapersonal and interpersonal abilities; this, in turn, results in a tendency to report fewer symptoms of anxiety and depression among adolescents with LD. Perhaps it is this element of monitoring that is increasingly necessary during adolescence while the acts of monitoring specific activities may decrease between childhood and adolescence.

Moreover, Parental Nurturing was a significant mediator that was directly related to lower levels of distress among adolescents with LD. The adolescent report of Parental Nurturing complemented the parent-reported Family Functioning measure by gathering information from adolescents themselves on their relationships with their parents and parenting behaviours. Parental Nurturing included adolescent reports of behaviours such as problem-solving, listening, and praising, the latter behaviour considered a key component of positive parenting (Seay, Freysteinson, & McFarlane, 2014). Positive parenting, specifically parenting praising behaviour in both early and late adolescents, has been found to be directly linked to better mental health (Tabak & Zawadzka, 2017). Existing research demonstrates early adolescents with LD are more sensitive than their peers without LD to the quality of parental resources such as positive affect and attachment systems (Al-Yagon, 2011). Majorano, Brondino, Morelli, and Maes' (2017) posit that positive parenting behaviours are crucial protective factors for adolescents with LD because the presence of LD intensifies the association between parent-adolescent relations quality and also adolescent loneliness and self-concept. Our findings support existing research that suggests parent relationships are positive influences related to reducing the potential impacts of the effects of living with LD for adolescents (Al-Yagon, 2011, 2012).

Finally, parents' ratings of their symptoms of depression were a significant albeit small predictor of reported symptoms of internalized distress among adolescents with LD. The relation between parental internalizing disorders and their chil-

dren's internalizing symptoms has been well documented (e.g., Beardslee et al., 2011; Van Loon et al., 2014) with parents of children with specific learning disorders or with "mental ill-health" have higher parental distress (e.g., Bonifacci et al., 2016; Wingrove and Rickwood, 2017). Letourneau et al.'s (2013) longitudinal study found early maternal depression was related to anxiety among 10 to 11-year-olds. While the mechanisms through which maternal depression affects children are not fully understood, parenting behaviours are important pathways to explore (Turney, 2011). In the current study, the parent's symptoms of depression were negatively linked to parental monitoring behaviours and family functioning, which in turn, mediated adolescents' perceptions of their social and emotional competencies and resulted in fewer symptoms internalized distress among adolescents with LD. Elgar et al.'s (2007) separate analyses of mothers and fathers of 10- to 15-year-olds found parents' symptoms of depression were associated with fewer nurturing and monitoring behaviours and more rejection behaviours, particularly for fathers. Also in younger children, Turney (2011) established some evidence that socioeconomic resources, family structure, and parenting stress were mechanisms through which maternal depression was linked to neglect, psychological aggression, physical assault, and engagement parenting behaviours. Likewise, Wilson and Durbin's (2010) meta-analysis found paternal depression had a significant yet small effect on parenting. Specific parenting behaviours assessed in the meta-analysis included a lack of positive emotions, warmth, sensitivity, and responsiveness, as well as increased negative emotions, hostility, intrusiveness, and disengagement. Notably, Wilson and Durbin highlighted evidence to support the hypothesis that the relation between parental depression and negative parenting behaviours is not limited to mothers who experience depression or depressive symptoms. Bonifacci et al. (2016) found no differences between mothers and fathers in parenting distress and parenting styles in the parents of children with specific learning disorders. Van Loon et al.'s (2014) study demonstrated parents' mental health disorders were linked to poor monitoring and less support for adolescents aged 11 to 16 years old. Importantly, based on our large sample and path analyses, our findings valuably add to the growing body of evidence that parents' depressive symptoms are a predictor of internalizing problems among adolescents with LD. These findings have implications for therapeutic intervention and support for parents and their children.

We also note the following limitations. Although the NLSCY survey data provided a sample large enough to make a statistical generalization, cross-sectional samples were not topped up to reflect immigration patterns, thus, they do not reflect current Canadian population trends. As survey participation is also dependent on voluntary family participation, the survey data reflects a self-selected population, and as with all surveys, methodology is subject to response bias. Due to the use of secondary data, we were also constrained by the specific measures and operationalization of the constructs studied. While the measures were psychometrically adequate, possessed adequate, future research that incorporates the same and additional measures to further examine constructs that continue to be ill-defined in the research (e.g., family functioning) would be worthwhile.

Our findings highlight the personal and familial influences related to internalized distress among adolescents with LD. Adolescent social and emotional competencies and parental nurturing had the largest influence on internalized dis-

tress. These results are consistent with the ecological resilience research on influential factors to development. We found that the association between parent-reported adolescent LD diagnosis and parent-reported adolescent emotional or psychological difficulty diagnosis had a small effect size, suggesting 36.3% of adolescents with an emotional or psychological diagnosis also have an LD diagnosis. While not longitudinal, the current findings on adolescents' adaptability and stress management abilities (i.e., social and emotional competencies) and familial influences (i.e., positive parenting and family relationships) do suggest these are important influences that act as potential buffers related to mental health problems. Importantly, clinicians and educators alike must take into account the coactional nature of the associations among learning factors, academic outcomes, and mental health symptoms when developing interventions for adolescents with LD.

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