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The Gender Effects of a Foster Parent-Delivered Tutoring Program on Foster Children's Academic Skills and Mental Health: A Randomized Field Trial

by

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Abstract

Children living in foster care are a particularly vulnerable group of children that are at high-risk for experiencing a multitude of difficulties, including poor academic performance and achievement. Although the academic underachievement of foster children has been well-documented for decades, very few attempts have been made to address the problem. This thesis is the second study to come out of the *RESPs for Kids in Care* research project, which represents one of three known randomized controlled trials aimed at providing an academic intervention to foster children with a view of improving their basic skills, increasing their chances of graduating from high school and enrolling in post-secondary education. Sixty-four foster children (aged 6 to 13 years), recruited from nine Children's Aid Societies in Ontario, Canada, participated in the project and received an individualized direct-instruction tutoring intervention that was delivered by their foster parent(s). The unique contribution of the current study was its investigation of differential gender effects of the tutoring amongst the foster boys and girls, and whether there were any mental health and social-relational spillover effects. A mixed-method approach was used to explore these differential effects and the main hypothesis of the project, that the foster children in the experimental group would demonstrate greater gains in reading and math than the children in the control group, between pre-test and post-test, regardless of gender. The results were promising: the foster children in the experimental group demonstrated significant gains in their basic reading and math skills after receiving the foster-parent delivered one-on-one tutoring; there were differential gender effects across the academic and mental health results; and there was partial support for the notion that an academic tutoring intervention does elicit spill-over effects into the mental health and social-developmental domains of foster children's lives. Results and implications were discussed.

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International and Canadian literature has indicated that one of the greatest needs of many young people living in out-of-home care is improvement in their educational achievement (Flynn, Ghazal, Legault, Vandermeulen, & Petrick, 2004; Jackson, 2007; Trout, Hagaman, Casey, Reid, & Epstein, 2008). This research has consistently demonstrated that many children and youth in foster care experience serious difficulties in their primary and secondary school achievement, typically lagging one or two years behind their peers in the general population (Trout et al., 2008). This disparity can be attributed to factors such as their pre-care experiences of abuse, neglect, or extreme poverty, as well as in-care events such as disrupted placements and changes in schools. As a result, young people in foster care are less likely to obtain a high school diploma or enrol in and graduate from post-secondary education (PSE), including university, college, and skilled-trade/apprenticeship training. These facts underline the necessity of increasing research focused on discovering ways to help improve their academic success and long-term outcomes.

The purpose of the current study was twofold: 1) to investigate whether there were differential gender effects amongst foster children who received an academic tutoring program, delivered by their foster parents, that aimed to improve their basic skills in reading and math, and 2) to discover whether there were secondary 'spillover' effects from the tutoring, such that the foster children also showed improvement in their mental health. In what follows, research will be reviewed that describes the challenges that many children in foster care face in their attempts to achieve academically. To structure the literature review, a heuristic model will first be proposed that provides a conceptual framework for understanding the factors that contribute to looked-after children's academic difficulties. Also, when relevant research is not available on

the academic achievement of children in out-of-home care, information will be extrapolated from research conducted on children in the general population.

Heuristic Model of Factors Affecting Foster Children's Educational Achievement

Slade and Wissow (2007) proposed a heuristic model linking maltreatment in the family of origin to the development of children's mental health and academic skill-development difficulties. Both types of problems are seen as leading, in turn, to the lower level of educational achievement among children in care that has been amply documented by Trout and her colleagues (2008). Slade and Wissow's model involves two key parallel processes that link maltreatment and educational outcomes (Figure 1). First, regarding mental health (pathway a), abusive or neglectful parent-child interactions, coupled with parent-parent conflict, increase the child's risk of developing emotional and behavioural problems. The maltreated child may, as a result, develop a heightened sensitivity and harsh reaction to perceived or actual threats and go on to experience more disruptive classroom behaviours, more frequent suspensions, and greater cognitive impairments (e.g., difficulties of concentration, motivation, short-term memory, impulsivity, and executive functioning). Second, on the academic-skill side (pathway b), abused or neglected children may have fewer resources and less cognitive stimulation at home, receive lower-quality informal and formal education, and develop poorer basic academic skills (e.g., in word knowledge, literacy, or numerical reasoning). In this way, maltreatment and family conflict may lead to lower levels of positive mental health and academic skill-development. As a result, poorer mental health raises the child's risk of adhering less to behavioural norms at school, gaining less support from teachers and classmates, performing inadequately on homework assignments and tests, and, overall, achieving academically below his/her potential (pathway c). Subsequently, the child's poor academic achievement may aggravate his or her

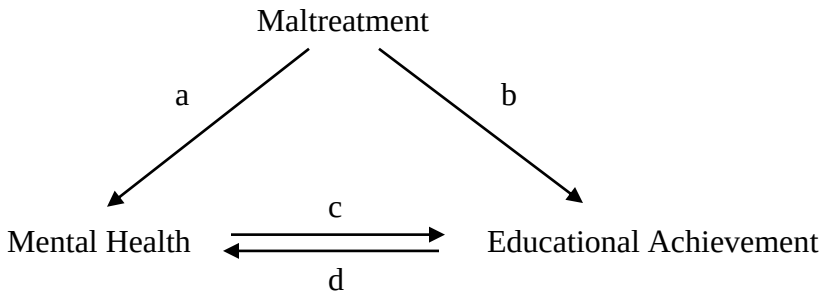

Figure 1. Slade and Wissow's (2007) Three-Factor Heuristic Model.

already vulnerable mental health, resulting in an increase in behavioural and emotional difficulties (pathway d).

To help anticipate the ensuing review of the literature, Slade and Wissow's (2007) heuristic model will be used as a guide to provide a basis for each of the four pathways. That is, the general implications of maltreatment on a child's development will first be presented, followed by an exploration of how maltreatment places a child at risk for mental health (pathway a) and academic difficulties (pathway b). Finally, research supporting the notion of a reciprocal impact of mental health and educational achievement will be presented (pathways c and d, respectively).

Research on How Maltreatment is Implicated in Poor Mental Health and Educational Outcomes

Children who are exposed to and endure any form of maltreatment have obviously different rearing experiences than do their nonmaltreated peers. Research has firmly established that such aversive experiences cause a significant number of maltreated children to exhibit a variety of deviations from normative development that often persist well into adulthood (Veltman & Browne, 2001). Several researchers have hypothesized that the observable

consequences of maltreatment on children's development are most likely due to exposure to prolonged stress, which has the potential to exert changes within the brain (Beers & De Bellis, 2002; Glaser, 2000; Pears & Fisher, 2005; Snow, 2009). This is because the human body naturally responds to stress by releasing of a series of neurochemicals in the brain in an attempt to cope with the stressor (Pechtel & Pizzagalli, 2011; Weber & Reynolds, 2004). Thus, when children endure abuse and neglect, they are typically exposed to higher levels of stress, for longer periods of time, than are children who have not endured such experiences. In turn, this exposure to extreme and chronic stress may exceed a child's coping resources, potentially compromising the structural and functional integrity of their brains and their subsystems (Choi, Jeong, Rohan, Polcari, & Teicher, 2009; Weber & Reynolds, 2004). The pervasive consequences of maltreatment are believed to be rooted in interrelated "multilayered effects" that interact and cumulatively impact all areas of a child's development (English et al., 2005).

Research has demonstrated that children who endure maltreatment tend to experience varying degrees of mental health difficulties (e.g., emotional, behavioural and social-developmental disturbances), and cognitive, memory, and language delays (Crooks & Peters, 2005; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Kaplan, Pelcovitz, & Labruna, 1999; Pears & Fisher, 2005; Pantin & Flynn, 2006; Snow, 2009). The presence of such difficulties, either alone or in combination, has the capacity to interfere with a child's ability to self-regulate his/her behaviour and emotions, or to appropriately engage in interpersonal and social relationships with peers and adults. These problems can also impede a young person's ability to achieve academically by affecting his/her ability to concentrate in class and subsequently apply information learned, or successfully complete school work.

Maltreatment as a risk factor for poor mental health. Following 'pathway a' from Slade and Wissow's (2007) heuristic model; research has consistently demonstrated that individuals who experience childhood maltreatment tend to present with significantly higher rates of mental health difficulties than do individuals in the general population who have never been exposed to such experiences (Burns et al., 2004)—a finding that seems to be consistent, even when controlling for sociodemographic variables (Garland et al., 1996). According to relatively recent reviews of the literature, the prevalence of clinically significant mental health difficulties among young people who have experienced childhood maltreatment is estimated to range between 40% and 80% (Burge, 2007; Czincz and Romano, 2009), figures that are in stark contrast to the rate of 14% to 18% of young people in the general population (Waddell, Offord, Shepherd, Hua, & McEwan, 2002). The most prevalent mental health symptomatology reported among maltreated young people includes depression, anxiety, hyperactivity and impulsivity, conduct problems (i.e., oppositional, defiant, aggressive and delinquent behaviours), irritability, paranoia, post-traumatic stress, poor emotion-regulation and interpersonal skills, low self-esteem, and suicide (English et al., 2005; Kufeldt, Simard, & Vachon, 2000; Trocmé et al., 2001; Veltman & Browne, 2001). Indeed, there appears to be relative consistency between studies based on children and adolescents' self-reports and those based on data provided by their caregivers, teachers and other adults on instruments such as the widely used Child Behavior Checklist (e.g., Kurtz, Gaudin, Wodarski, & Howing, 1993; Nolin & Ethier, 2007) or the Strengths and Difficulties Questionnaire (Marquis & Flynn, 2009; 2012). Moreover, such difficulties have been associated with negative self-perception, poor interpersonal skills, and problems in making and maintaining friends (Essau, Sasagawa, & Frick, 2006; Teggart & Menary, 2005).

As a group, young people living in out-of-home care are particularly vulnerable to mental health difficulties due not only to their maltreatment history, but also to a number of other factors that put them at an increased risk for experiencing mental health difficulties, such as being admitted into foster care, that exacerbate such problems (Burge, 2007; Pears & Fisher, 2005). These facts highlight the need to promote the early detection of and intervention with looked-after children's mental health needs, because the provision of services could enhance their psychological, social, and academic functioning (Goodman, Ford, Corbin, & Meltzer, 2004; Kufeldt, 2000). Now onto 'pathway b' of Slade and Wissow's (2007) heuristic model.

Maltreatment as a risk factor for poor academic achievement. Numerous studies have consistently shown an association between maltreatment and an increased risk of academic difficulties (Rowe & Eckenrode, 1999), even when controlling for background variables, including poverty, parental education, sibship density, race, and gender (Leiter & Johnsen, 1994; Trout et al., 2008). Throughout primary and secondary school, a substantial number of maltreated children and youth experience serious difficulties in academic achievement (Flynn, Ghazal, Legault, Vandermeulen, & Petrick, 2004; Jackson, 1994) that can be observed as early as preschool; the risk appears to be constant across the elementary school years and into high school (Pears, Fisher, Bruce, Kim & Yoerger, 2010).

Maltreatment has been associated with academic risk due to its devastating effects on multiple domains of development necessary for learning, including cognition, language, literacy and social-emotional skills (Rouse & Fantuzzo, 2009). Among the documented academic difficulties, abused and neglected children have been found to have multiple failing grades, perform poorly on tests of academic achievement and on their classroom work. Support for these findings comes from several reviews of the extant literature in which maltreated children

were found to score approximately one standard deviation below their peers on language, reading, and mathematical subtests of standardized tests of academic achievement (Crozier & Barth, 2005; Eckenrode, Laird, & Doris, 1993; Kurtz et al., 1993; Pantin & Flynn, 2006; Shonk & Cicchetti, 2001). Further, Zetlin, Weinberg, and Kimm (2005) estimated that upwards of 75% of maltreated children perform below grade level in English (i.e., basic reading, reading comprehension, and spelling) and Mathematics, as compared to their nonmaltreated peers.

Maltreated children have also been noted to experience more absences and disciplinary referrals (Kaplan et al., 1999; Leiter & Johnsen, 1994; Pears & Fisher, 2005) and are approximately 50% more likely to be retained at least one year in school than their peers (Zetlin et al., 2005). They appear to be over-represented among referrals for and placements in special education classes, with an estimated rate of 25% to 50% of maltreated children versus 15% of children in the general population (Leiter & Johnsen, 1997; Veltman & Browne, 2001). As a group, maltreated children are also more likely avoid school, be rejected by their peers, be less apt to participate in class and experience more school placements; they are also twice as likely to drop out of school and less likely to earn a GED (Shonk & Cicchetti, 2001; Stone, 2007; Trout et al., 2008).

Although there is good correlational evidence of a negative relation between maltreatment and academic achievement (Shonk & Cicchetti, 2001; Slade & Wissow, 2007), this negative relation has been established primarily with young people in the general population rather than with young people in foster care. Whether an individual resides in the general population or in foster care, it can be assumed that the consequences of maltreatment are similar and that young people living in out-of-home care are particularly vulnerable to developing academic difficulties. This notion is especially based on the fact that looked-after children and

adolescents have not only experienced sufficient adversity to warrant removal from their families of origin, but they also face additional stressors that other children do not tend to experience (i.e., placement in foster care, disruptions in their school placements and academic courses, etc).

Mental health difficulties as a risk factor for poor academic achievement.

Corresponding to 'pathway c' of Slade and Wissow's (2007) heuristic model, this subsection explores mental health difficulties (including self-perception) as a risk factor for poor educational achievement. Although no direct cause-and-effect has been established, there is a logical assumption that emotional and behavioural difficulties negatively impact a child's ability to achieve academically. Moreover, it remains unclear whether such symptomatology precedes or is sequelae to maltreatment or how these factors are related to a child's academic vulnerability (Kaplan et al., 1999; Stone, 2007). In any case, research has ascertained an association between mental health and the hindrance of the skills and abilities a young person needs for optimal learning, including short-term memory, the ability to concentrate , and the motivation to complete work (Frankel, Boetsch, & Harmon, 2000; Slade & Wissow, 2007; Toth & Cicchetti, 2006). Young people who experience such difficulties are more likely to avoid school, be rejected by their peers, be less apt to participate in class, perform poorly on tests of academic achievement, have more failing grades, be more likely to be retained a grade, and drop out of school (Crooks & Peters, 2005; Shonk & Cicchetti, 2001; Thompson & Raikes, 2007).

The association between mental health difficulties and school performance is believed to be bidirectional (DeSocio & Hootman, 2004; Flemming et al., 2005; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004; Trout et al., 2008), although this is a conclusion based on logical considerations rather than on research data, in part due to the fact that mental health remains one of the least explored influences on academic achievement (Baskin, Slaten, Sorenson, Glover-

Russell, & Merson, 2010). Research has shown that early academic difficulties and failure are strong predictors of mental health difficulties: underachievement produces inappropriate behaviour and generates negative feelings of frustration and incompetence, while emotional and behavior problems, such as depression, anxiety and inattention, negatively influence academic achievement (Roeser, Eccles, & Strobel, 1998; Trout, Nordness, Pierce, & Epstein, 2003). Conversely, academic success has been associated with fewer behavioural and emotional problems and a more favourable long-term outcome (DeSocio & Hootman, 2004; Flemming et al., 2005; Reid et al., 2004; Roeser et al., 1998; Zingraff, Leiter, Johnsen, & Myers, 1994). Although little is known about the developmental dynamics influencing the bidirectional relation between academic achievement and mental health and behaviour problems, the research appears to support the notion that if these reciprocal interactions remain without intervention, they will eventuate into widespread comorbidity among high-risk children and will impact children's short- and long-term outcomes (Roeser et al., 1998; Trout et al., 2003).

Most of the research to date has focused on the association between academic achievement and externalizing problems (i.e., behaviour problems), or the combination of externalizing and internalizing problems (i.e. behaviour and emotional problems) (Halonen, Aunola, Ahonen, & Nurmi, 2006). Thus, little is known about the immediate relation between internalizing difficulties and academic achievement. However, based upon the few studies that have investigated this association, the results suggest that the experience of internalizing symptoms (e.g., depression) is associated with lower teacher-reported grades, lower scores on standardized tests of achievement, and poor peer relationships (Roeser et al., 1998). In one of the few studies conducted investigating the impact of internalizing problems on the academic achievement, Halonen et al. (2006) assessed the mental health and reading performance of 196

'normal' (i.e., nonclinical) young children, aged 5- to 6-years, during their preschool year and first grade. The results demonstrated that internalizing problems predicted subsequent problems in reading performance amongst the participating children, both during the transition from preschool to primary school and while in primary school.

Studies investigating the effects of externalizing behaviour on academic achievement have found an association with reading difficulties, with comorbidity rates estimated to be between 10% and 50% (Halonen et al., 2006; Hinshaw, 1992). In his review of the literature, Hinshaw (1992) reported that the overlap often begins during the preschool years and persists throughout a child's academic career, stating, "externalizing behaviour disorders overlap considerably, with at least some degree of academic underachievement, with the predominant link between ADHD and achievement delays in childhood giving way to a strong association between delinquency and school failure in adolescence" (p. 897). Supporting this reflection, Roeser et al. (1998) reported that externalizing problems have been associated with a myriad of school-related difficulties, including learning delay, misconduct in the classroom, poor achievement, aggressive behaviour, social rejection, and dropping out of school. Furthermore, when externalizing and internalizing difficulties co-occur, academic difficulties continue to persist. That is, children with emotional and behavioural problems have been found to have lower reading and arithmetic scores, lower graduation rates, and are less participation in PSE (Kauffman, 2001; Trout et al., 2003).

Turning now to the self-perception aspect of mental health, self-perception (i.e., beliefs and feelings about oneself) develops through an individual's experience with and reinforcement from his or her environment and significant others (Shavelson, Hubner, & Stanton, 1976, as cited in Bong & Clark, 1999). Research suggests that throughout childhood, individuals begin to

develop perceptions of self across a number of relatively independent domains, including academic, social, and athletic competence (Harter, 1982). However, it appears that it is not until mid-childhood (i.e., around age 9) that children have the ability to make global assessments of their self-worth across the domain-specific concepts of the self (Harter, 1982). Self-perceptions of competence are considered to be important components in most theories of achievement motivation (Vondra, Barnett, & Cicchetti, 1989).

Perceived academic self-competence constitutes one aspect of an individual's view of the self and appears to develop through the support and approval of significant others, including parents or primary caregivers (Harter, 1998). For example, among children in the general population, Phillips (1987) found a significant relation between third grade students' perceptions of their academic competence and their parents' perception of their abilities. Although there are inconsistencies in the literature, there is evidence to suggest that self-perception of academic ability does, to some extent, influence academic achievement. For instance, Phillips (1984) found that among a group of general-population fifth graders, students who reported lower levels of perceived academic competence also reported lower expectations and standards for their performance, were more likely to attribute the achievement of high grades to effort rather than ability, felt as though their teachers had lower expectations for them than other students, and were rated by their teachers as persisting less on academic tasks than their high academic self-perceiving counterparts. Similar relations have been found to be true for students with and without learning disabilities (see Meltzer, Katzir, Miller, Reddy, & Roditi, 2004 and Stringer & Heath, 2008, for examples). Overall, it appears as though individuals who have a negative self-perception are at risk of not putting forth their best effort, despite their actual capacity or ability. This reduces their likelihood of succeeding academically, whereas individuals who perceive

themselves positively are more likely to perform to their full potential and thus increase their chances of succeeding academically (Barnett, Vondra, & Shonk, 1996; Bong & Clark, 1999).

Research conducted with children who have experienced abuse or neglect has demonstrated that they are particularly at risk of developing negative self-perceptions, including a poor academic self-perception, due to the lack of positive support and encouragement from their parents (Harter, 1998). Vondra, Barnett, and Cicchetti (1989) sought to compare the self-perception of academic competence among maltreated and nonmaltreated children in grades 1 through 6. They found that children in grades 1 through 3 who had a history of maltreatment tended to describe themselves in exaggeratedly positive terms, claiming that they were more academically competent than they actually were, compared with the self-descriptions of their non-maltreated peers. On the other hand, older children (in grades 4 through 6) with a history of maltreatment described themselves as being less competent and less accepted than their nonmaltreated peers.

These results were replicated by Barnett et al. (1996), and subsequently partially replicated and further elaborated by Kinard (2001). In her study, Kinard compared a group of children aged 6 to 12 years who had a history of abuse or neglect with a matched group of children who had no history of maltreatment to determine 1) whether maltreated children's accuracy of estimating academic competence differed from that of nonmaltreated children and 2) to establish whether a discrepancy between perceived and actual academic competence among maltreated children was related to perceived support from mothers, teachers and peers. In general, replicating previous findings, younger maltreated children and boys were more likely to overestimate their academic abilities, compared with older children and girls. Although the results indicated that maltreated children had significantly lower achievement scores, as assessed

by the Wide Range Achievement Test, compared to their nonmaltreated counterparts, the two groups of children did not differ significantly on their self-perceptions of academic competence. For the sample as a whole, regardless of their history of maltreatment, children who reported a lower level of perceived support from their mothers were more likely to overestimate their reading competence, as compared to children who reported average or high levels of perceived maternal support. When maltreatment history was considered, maltreated children were more likely than nonmaltreated children to overestimate their reading and arithmetic competence but not their spelling competence. Kinard interpreted these results as suggesting that children with a history of maltreatment or who have low levels of maternal support might overestimate their abilities to enhance their self-image in reaction to feelings of inadequacy.

Even though there is a conceptual association between mental health and academic difficulties, the literature appears to primarily address mental health as a risk factor for poor educational outcomes. Therefore, the following subsection will explore the limited literature that has explored the reciprocal relation between academic difficulties and mental health problems (i.e., pathway d of the heuristic model).

Academic difficulties as a risk factor for mental health problems. Investigations into the association between academic difficulties and emotional and behavioural problems have found consistent and overlapping results with those exploring the converse relation. Reading difficulties, which appear to have been the most-researched area of academic performance in this area, have been regularly associated with internalizing and externalizing behaviour problems among children in all grades (Halonen et al., 1996; Hinshaw, 1992; Trout et al., 2003). However, deficits in basic skills of reading, writing and arithmetic have been found not only to impair a child's ability to function academically, but also to be positively correlated with

emotional and behavioural problems (Hinshaw, 1992; Trout et al., 2003). Indeed, chronic negative academic outcomes tend to generate feelings of anxiety, anger, disinterest, unworthiness and negative self-perception (Roeser et al., 1998; Trout et al., 2003), which, in turn, can lead to or exacerbate externalizing difficulties and strained teacher and peer relationships (Lane, 1999).

Two recent studies from Sweden help to establish, more concretely, the correlation between poor academic achievement and mental health within the general and foster care populations. Utilizing the data from the longitudinal Stockholm Birth Cohort Study, in which a large number of Stockholm children were followed from infancy through to age 48years, Nilsson and Estrada (2009, as cited by Berlin, Vinnerljung, and Hjern, 2011) found substantial associations between low school grades in the final years of primary school and criminal behaviour in adolescence and adulthood, after controlling for a range of childhood factors, including socio-economic background.

Likewise, Berlin et al. (2011) used data obtained from the Swedish national register (1972-1981) to "analyze longitudinal associations between average grade points in primary school, future education, and adverse psychosocial outcomes in young adulthood among youth who aged out of long term foster care" (pp. 2489-2490) and compared their outcomes with those of national adoptees, peers who had received in-home interventions before their teens, and majority population peers. Based upon the results of 10 birth cohorts (N = 913,207), 70% to 88% of the psychosocial problems reported (i.e., suicide attempts, drug and alcohol abuse, and serious criminality) were associated with poor performance in elementary and high school. Moreover, those adults who had been placed in long-term foster care in childhood were less educated than any of the other groups and had strikingly higher risks for the psychosocial problems previously mentioned, at a rate of three to five-times higher than their majority

population counterparts. In terms of gender, among those young adults who had been placed in long-term foster care and earned poor grades in primary school, 58% of males and 45% of females demonstrated psychosocial problems by age 25 years. This is in comparison to the 19% of the males and 13% of the females within the majority population who also earned poor grades. The authors concluded that although the results paint a "dark picture" of the associations between poor academic performance and attainment, and risks for future psychosocial problems, both in the general population but also among former long-term foster children, there is hope. That is, being able to attribute the high risk for psychosocial problems in young adulthood to poor school performance, a variable that can be influenced by intervention, there is reason for hope—that with improvement in children's academic skills and performance, their risk for future psychosocial problems could be reduced.

Of importance and relevant to note, very few studies have explored or examined gender differences with regard to the bidirectional association between academic achievement and behavioural disorders (Hinshaw, 1992; Trout et al., 2003). This is an important consideration because not only do girls typically report higher levels of internalizing difficulties and lower levels of externalizing difficulties, vis-à-vis boys, but they are also thought to perform in a different manner academically (Hinshaw, 1992; Trout et al., 2003). Thus, the differences detected to date may be reflecting gender-related differences rather than absolute levels of underachievement or internalizing/externalizing problems (Shaywitz, Shaywitz, Fletcher, & Escobar, 1990).

Having talked about the links between maltreatment, poor mental health and educational achievement, the next sections document more thoroughly the fact of poor academic

achievement among young people in care. Subsequently, potentially effective interventions that seem promising in helping to address the issue of low scholastic achievement will be presented.

Low Educational Achievement Among Children in Care

Extant literature amply demonstrates that, as with maltreated children in general, many young people in foster care experience significant academic challenges and disadvantages, including inconsistent school attendance, below-grade academic performance, and low scores on standardized tests of academic achievement in reading, writing and mathematics (Jackson, 2007; Kufeldt et al., 2000; Mitic & Rimer, 2002; Osborn, 2006; Pantin & Flynn, 2006; Shonk & Cicchetti, 2001; Slade & Wissow, 2007; Stone, 2007; Trout et al., 2008). As previously discussed, likely due to their experiences of maltreatment, many of these young people also have significant cognitive and language-skill deficits and poor problem-solving and reasoning skills (Kufeldt et al., 2000; Trout et al., 2008), and they are approximately three times as likely as their peers in the general population to be involved in special education (Trout et al., 2008).

The academic difficulties of children in care have been documented for decades. Fanshel and Shinn (1978) conducted one of the first longitudinal studies on the educational status of children in care and reported that over 50% of the children were performing below grade level and approximately one-third were, on average, two-years behind in reading ability, compared to their peers in the general population. Even after remaining in foster care for over five years, most of the young people had not improved. Thirty-five years later, it does not appear as though our foster children are faring any better, as reflected by the findings by Trout et al. (2008). The results of the relatively few published Canadian studies on the educational attainment of children and adolescents in care have found similar results: as compared to their general-population peers, approximately one-quarter of all looked-after children in Canada are performing below grade

level, while one-third are reported to have significant learning difficulties (Kufeldt et al., 2000), a rate more than three-times the national average (Ferguson & Wolkow, 2012). Moreover, an estimated 52% of youth leaving care had not completed Grade 12 (Rutman, Hubberstey, Feduniw, & Brown, 2007) versus 25% of the general population (Ontario Ministry of Education, 2008, as cited by Ferguson & Wolkow, 2012). At a provincial level, young people living in out-of-home care in Ontario were found to have higher rates of grade retention and school suspension than their same-aged peers in the general population (Flynn & Biro, 1998). More recent provincial statistics indicate improvements among the long-term foster youth (i.e., Crown wards); 93% of the Crown wards aged 16 and 17 years were attending an educational program during the 2008/2009 academic year, while 23% of Crown wards aged 18 through 20 years were enrolled in a PSE program (of these, 81% are enrolled in college or an apprenticeship program and 16% are enrolled in university) (Ontario Association of Children's Aid Societies; OCAS, 2010). Although these results are promising and do reflect an overall improvement from those previously released reflecting the 2006/2007 academic year, the rates reported are still approximately half of the provincial average (OACAS, 2010).

In the long-term Ontario Looking After Children (OnLAC) project, Flynn et al. (2004) compared two groups of young people in care in Ontario, aged 5 to 9 and 10 to 15, respectively, with nationally representative samples of the same age from the general Canadian population. Eighty percent of the older children and 78% of the younger children in care were rated by their foster parents as performing educationally in the same range as the lowest third of the general-population comparison groups, who themselves had been rated by their own parents in terms of their reading, spelling, math, and overall educational performance. In more recent data from the OnLAC project, 68% of young people in care aged 10 to 15 years were observed to change

schools three or more times, for reasons unrelated to the normal progression through the school system (Miller, Flynn, & Vandermeulen, 2008). Also, the proportion who repeated a grade increased with age, such that 16% of 5-9 year olds in care, 27% of 10-15 year olds, and 32% of 16-20 year olds were found to have repeated a grade.

Additional data from the OnLAC project have shown that academic difficulties among young people in out-of-home care are especially prevalent among boys. Miller, Vincent, and Flynn (2009) found, for example, that among almost 2500 youths aged 10-15 in care in Ontario, girls were less likely than boys to undergo assessments for learning-related problems (58% vs. 79%), to have had an individual education plan (51% vs. 73%), or to have received special academic help at school (49% vs. 69%). The girls' school performance was also evaluated more highly by their caregivers: 24% were rated as performing very well or well in written work, compared with 13% of the boys; 41% (vs. 28%) were seen as doing very well or well in reading, and 29% (vs. 20%) were rated as doing very well or well overall. Only in math were equal proportions of boys (23%) and girls (24%) rated as performing 'very well' or 'well' by their caregivers. The girls also tended to be more positive about educational matters than the boys, with 37% (vs. 28%) reporting that they read for fun every day and 40% (vs. 26%) aspiring to attain one or more university degrees. These gender-related findings are consistent with trends documented within the general population, both in the United States and United Kingdom, in which girls have been found to outperform boys in all major academic subjects, including reading, writing, science and math (Hartley & Sutton, 2013), and go on to outnumber males enrolled in university degree programs at a rate of approximately 1.4:1 (Higher Education Statistics Agency, 2011; Snyder & Dillow, 2011, as cited by Hartley & Sutton, 2013). Only one study, to our knowledge, has investigated gender-based discrepancies within a child welfare

context and documented similar findings as those noted in the general population—female foster youth appear to be achieving higher levels of academic performance, educational expectations and educational attainment than male foster youth (Kirk, Lewis, Brown, Nilsen & Colvin, 2012).

Despite the documentation of existing difficulties in educational performance among so many looked-after children and youth, considerable uncertainty remains regarding the causes (Aldgate, Colton, Ghate, & Heath, 1992). Some authors have proposed that young people in care do not receive the same level of family and social support that many children in the general population receive, thus placing these young people at further and disproportionate educational disadvantage and risk. Other reasons include the fact that foster children's education has not been a priority by the child welfare system, including by the children's social workers or foster parents, while others have suggested that it is the low expectations of foster parents, social workers, and teachers, with regard to foster children's attainment that are contributing to their ongoing difficulties (Driscoll, 2011; Ferguson & Wolkow, 2012; Tideman, Vinnerljung, Hintze, & Isaksson, 2011). Whatever the causes, poor school performance and low educational achievement are believed to be among the strongest risk factors for looked-after children's futures (Jackson, 1994), and the links between poor achievement and unfavourable psychosocial outcomes are strong, even after controlling for characteristics of birth parents, time in care, and age at first placement (Forsman & Vinnerljung, 2012). Despite the wide documentation of foster children's academic difficulties and poor school achievements internationally, there have been few evaluated attempts aimed at remediating the problem (Forsman & Vinerljung, 2012; Tideman et al., 2011; Trout et al., 2008). In fact, there is virtually no published, peer-reviewed research investigating the effects of controlled educational interventions on improving the academic success of young people in foster care. This point was highlighted in the attempt by

Trout and her colleagues (2008) to review and synthesize American research on this specific topic. Despite reviewing 66 years of research (1940-2006) conducted in the US on the academic status of youth in care and published in US journals, Trout et al. (2008) found too few controlled evaluations of educational interventions to be able to conduct the intended synthesis.

Having documented the dimensions of the alarming situation, the question remains, 'What can we do about it?' Despite the reported poor academic outcomes amongst foster children, some authors, including Forsman and Vinnerljung (2012) and Tideman et al. (2011), have noted that this particularly vulnerable group of young people are also achieving below their actual ability, likely due to a gap in knowledge that has accumulated over the years, rather than from low intelligence or behavioural difficulties. If this is true, there is hope these gaps can been filled through the receipt of focused academic support and suggests that young children and adolescents living in out-of-home care are not condemned to a lifetime of poor outcomes.

Indeed, there is hope. Four years after Trout et al. (2008) attempt to review the US literature, Forsman and Vinnerljung (2012) conducted a more extensive, scoping review spanning 35 years of the English and Scandinavian language (i.e., Swedish, Danish, Norwegian) literature, and examined evaluated interventions to improve the academic skills of children and youth in foster care. To be included in their review, published and unpublished studies needed to involve: a longitudinal design in which there was an evaluation of an intervention aimed at improving school achievements; target children and youth (ages 6-15 years) living in out-of-home care; the evaluated intervention could involve either a randomized controlled trial (RCT) or a quasi-experimental design with pre- and post-intervention measures, or pre- and post-intervention measures with age standardized assessment instruments without a comparison group; and the outcome measures were to involve school achievements, involving age

standardized measurements, grades, or teacher assessments. In all, 11 studies were included in their review; five intervention programs used a pre-post design with standard instruments without a comparison group, three involved a quasi-experimental design, and three were based on an RCT-design. Only two of the eleven evaluations employed more than 100 participants. Of the 11 programs reviewed, nine reported improvement in foster children's reading. Five of these studies were based on tutoring, four of which produced positive results. A detailed description and review of these five tutoring programs will now be presented.

Improving the Basic Academic Skills of Foster Children Through Intervention

Although there are few published, peer-reviewed research investigating the effects of controlled educational interventions on improving the academic success of young people in foster care, the results of those studies that are in existence are promising. As mentioned, the five tutoring studies included in Forsman and Vinnerljung's (2012) review are described in further detail here—two pre-post designs and three randomized controlled trials.

Olisa, Stuart, Hill, Male and Redford (n.d., as cited by Forsman & Vinnerljung, 2012 and Tideman et al., 2012) conducted a quasi-experimental pre-post intervention study that sought to evaluate the effectiveness of a volunteer teacher-delivered tutoring program. Over the course of the 20-week intervention, 10 foster children received tutoring in literacy, 10 children received training in numeracy, and three children did not receive any intervention and served as the comparison group. The children (aged 5-11 years) received approximately 33 hours of tutoring twice a week. All participants were assessed using standardized instruments for cognitive ability and literacy/numeracy skills prior to the intervention and at the conclusion of the study (Tideman et al., 2011). The results indicated positive effects of the tutoring; the foster children in both intervention groups made improvements in their literacy skills, while improvements in numeracy

skills were only significant for those who received tutoring in math (Forsman & Vinnerljung, 2012). It was concluded that the results yielded positive effects of the academic training sessions such that the participating children "had made progress and were catching up with their peers in reading, spelling and math" (Tideman et al., 2011, p. 45). However, despite these optimistic results, it is important to recall that the overall sample size was small, there were relatively few participants in each of the groups, and the control group consisted of only three children.

In their pre-post design study, Osborne, Alfono, & Winn (2010) sought to involve foster parents in their foster children's daily learning through a structured paired reading intervention. Thirty five foster children, ages 5 through 11 years (M = 9.4 years, SD = 1.9 years) and their caregivers were recruited and participated in the study. The foster parents attended training workshops and subsequently shared in the paired reading programme with their foster children, who were permitted to select their own reading materials, for a minimum of 20 minutes three times a week over 16 weeks. During this time, school staff liaised with the foster parents on a weekly basis and kept track of the weekly monitoring sheets the carers had been asked to complete. The foster children's reading age was assessed by teachers prior to the start and at the end of the 16-week paired reading intervention. According to the authors, the results of their study revealed significant results; that over the four-month intervention, the foster children made an average of one year's progress in their reading skills. Based upon these findings, it was concluded that paired reading offers "a useful and effective short-burst intervention for enhancing the literacy of children in foster care" (Osborne et al., 2010, p. 22). However, this study has several limitations, including: no control group; several schools reportedly did not return evaluation data for some of the children; although the children made positive gains, their reading levels still lagged behind those of their peers; and the intervention lasted only 16 weeks,

which left the authors contemplating whether a longer duration would have elicited greater improvement amongst the participating children.

Courtney and colleagues (2008) have produced one of the few extant controlled evaluations of an educational intervention for young people in care. Although of particular interest to the present thesis because it assessed the impact of academic tutoring, the study by Courtney et al. could not be included in the review by Trout and her colleagues (2008) because it appeared after their cut-off date of 2006. Even if it had been available, it would not have met the inclusion criteria of Trout et al. because it was a research report rather than a peer-reviewed article published in a US journal.

In sum, Courtney et al. (2008) evaluated a randomized tutoring intervention aimed at improving the reading and math skills of youth in foster care who were 14 or 15 years of age and one to three years behind expected grade level in both subjects. The Early Start to Emancipation Preparation (ESTEP) Tutoring Program was intended to provide eligible participants up to 65 hours of tutoring from college-aged tutors who met with the foster youth in their homes and used standardized curriculum materials that matched the young people's level in vocabulary, spelling, and math. The foster youth were also invited to attend workshops on other independent-living topics that were held at 12 community colleges. The goals of the study were to improve the basic academic skills of the participants while encouraging continuation of their education and to promote opportunities for relationships to develop between the youths and the tutors. It was expected that this mentorship relationship would help to support the participants' positive attitudes toward learning, improve their ability to relate to other adults, and to empower them to advocate for themselves by encouraging them to access other educational services and resources that might be available to them within the community.

In all, 236 foster youths were randomly assigned to the ESTEP Tutoring group and 209 to the control group. At the two-year follow-up, 94% of the ESTEP Tutoring group and 91% of the control group were re-interviewed; of the original participants randomly assigned to the ESTEP-Tutoring group, only 62% had actually participated in the tutoring program, receiving an average of 18 hours of tutoring in math and 17 hours in reading. Also, reflecting the fact that the evaluators were not administratively in charge of the operation of the program, approximately 12% of the control group had somehow received the tutoring intervention, with a dosage level similar to that of the experimental group. This 'leak' of the intervention confounded the results, making it difficult to establish the independent effect of the ESTEP program on the youths' academic outcomes (Courtney et al., 2008).

The results demonstrated no statistically significant effects of the ESTEP-Tutoring program on any of the educational outcomes, including the youths' grades. Although all participants made statistically significant gains on passage comprehension, the youth also had significant *decreases* in their age-percentile averages on word identification and math calculation tests, signifying they lost a significant amount of ground on these measures. Furthermore, the participants did not experience significant changes in their school grades over the course of the study, and reported moderate- to low-levels of school-related problems. Few of the tutoring relationships developed into longer-term mentoring relationships. The authors concluded that, despite their inability to improve the educational skills of the foster youth in their study, "additional models should be developed and assessed to help foster youths who are struggling in school" (Courtney et al., 2008, p. vi).

In the first study published from the *RESPs for Kids in Care* project (i.e., the same project within which the current investigation occurred), Flynn, Marquis, Paquet, Peeke, and

Aubry (2012) sought to evaluate a randomized effectiveness trial testing the hypothesis that elementary school-aged foster children who have received an individualized, foster parent-delivered direct instruction-based tutoring intervention (i.e., *Teach Your Children Well*; Maloney, 1998) would experience significantly greater pre-test to post-test gains in their reading and mathematics skills, than their wait-list group counterparts who did not receive the intervention during the first year of the study.

At the pre-test, 77 foster children from 9 local Children's Aid Societies across Ontario, Canada, participated in the study (see the Methods section below in this document for a detailed description of the recruitment and randomization of participants, as well as a description of the tutoring program and details of the procedures of the study). Forty-two foster children were randomly assigned to an experimental (tutoring) group and 35 to a wait-list control group. Each participating foster child, regardless of which group to which they had randomly assigned, was assured of receiving $1,400 the form of a Registered Education Savings Plan for their participation in the two-year study. The foster children were told by the research team at the outset of the study that education is important and the money deposited in their RESP was a contribution towards their post-secondary education. Foster parents were asked to convey this message to their foster children at least weekly over the course of the study.

The Wide Range Achievement Test—Fourth edition (WRAT4; Wilkinson & Robertson, 2006) was used to assess each foster child's reading, spelling, and math skills at the pre- and post-test. Subsequently, over the course of one academic year, the foster parents in the experimental group delivered the *Teach Your Children Well* tutoring curriculum to their respective foster child(ren) for a total of 3 hours per week, per child. The wait-list control group participants were asked to continue 'as usual' throughout the school year; that is, the foster

parents and children agreed not to seek additional tutoring or other academic support because the foster child had been randomly assigned to the wait-list control rather than to the experimental group. At the post-test, all of the foster children were reassessed by the research team, who had hypothesized that the foster children in the experimental group would experience significantly greater pre-test to post-test gains in reading and math than would the foster children in the wait-list control group.

Using Analysis of Covariance (ANCOVA) via multiple regression and adjusting the foster children's post-test scores by their pre-test scores to reduce error variance, the results demonstrated that the foster children in the experimental group had made statistically and substantively important gains[1] on two of the five WRAT4 subtests, namely, Sentence Comprehension ($g = 0.38$, $p < .05$, one-tailed) and Math ($g = 0.46$, $p < .01$, one-tailed), and, at the level of a trend on Reading Composite ($g = 0.29$, $p < .10$, one-tailed). However, the experimental group's adjusted post-test scores on Word Reading ($g = 0.19$, *ns*) and Spelling ($g = -0.08$, *ns*) were not substantively important or significantly higher, on average, than those of the control group. The authors concluded that the direct-instruction foster parent-delivered tutoring program had had an important effect on foster children's math computation and sentence comprehension skills, as well as on their reading comprehension, but not on their word reading or spelling skills (Flynn et al., 2012). Furthermore, treatment fidelity analyses indicated that, unlike in Courtney et al.'s (2008) study, none of the foster children in the wait-list control group had received the tutoring program during the intervention year, lending further support to the positive impact of the tutoring curriculum on the participants' gains. Taken together, the results of this study lend support for the positive impact of tutoring interventions on foster children's

[1] See p. 92 for a description of what constitutes a substantively important gain.

academic skills, while capitalizing on the readily available resource of the foster parent to assist the children in making these positive gains in academic skills (Flynn et al., 2012). Several limitations of this study included the ability and motivation amongst foster parents to implement the tutoring regime of three hours a day for 30 weeks—although the implementation criteria were clearly outlined during recruitment, several foster parents were surprised to find that they tutoring required a lot of work; several foster parents also commented that a two-day training session (rather than the one day that was provided) would have been helpful in clarifying issues associated with the implementation of the tutoring program; and several foster children who had been nominated for participation in the study demonstrated intellectual or behavioural functioning that made the tutoring difficult and contributed to their withdrawal from the study.

Following Flynn et al. (2012), Harper (2012[2]; Harper & Schmidt, 2012) also conducted a two-year randomized control trial that sought to evaluate the effectiveness of the *Teach Your Children Well* (Maloney, 1998) tutoring program. However, in this study, the tutoring was administered to small groups of foster children in Northern Ontario. A secondary goal of the study was to assess the effectiveness of using university student volunteers to deliver the program. This study was particularly unique because not only is it one of the only known interventions delivered in a group format, but nearly 80% of the participating foster children were of Aboriginal heritage.

The participating foster children, who were in grades 2 through 8, and living in either foster or kinship care had been nominated by their child welfare worker for participation in the study and had been deemed by the worker as having fallen behind in their academic achievement, could benefit from a 25-week academic tutoring intervention, have sufficient

[2] Although Harper and Schmidt (2012) study was recently published, the results of Harper's (2012) unpublished doctoral dissertation will be reported on and presented as it reflects the definitive results of the 2-year trial of *TYCW* tutoring program. The results presented by Harper and Schmidt (2012) were only the first year results.

behavioural control to be able to participate in a small-group instruction format, and were not intellectually challenged. Once the children had assented and their caregivers had consented to their participation in the study, the children were randomly assigned to either a wait-list control group or an intervention (tutoring) group. The children's academic skills were assessed using the WRAT4 (Wilkinson & Robertson, 2006), at pre- and post-tests. As part of their pre- and post-test assessments, the foster children's caregivers completed two commonly used measures to assess for hyperactivity and inattention (i.e., The Conners' ADHD/DSM-IV Scale- Parent version, CADS-P; Conners, 2001) and symptoms of depression and anxiety (i.e., the parent-version of the ASEBA; Achenbach & Rescorla, 2001).

The volunteer university students were recruited to deliver the tutoring program. Once they agreed to help deliver the weekly intervention in each of the two years of the study, they completed a two-day training with the developer of the curriculum, who also monitored the performance of the volunteers throughout the course of the study.

By the end of the two-years, 101 foster children (51 children in the experimental group and 50 in the control group) had been recruited to participate in the study. Due to attrition, however, the analyses were conducted on the outcomes of the foster children who completed the study, from pre-test to post-test (i.e., 45 children in the experimental group and 46 children in the wait-list control group). The results indicated a significant effect for word reading (g = 0.4) and math computation (g = 0.34), and although not statistically significant, the effect size for spelling (g = 0.25) reflected small-to-moderate gains. However, the outcome for sentence comprehension was nonsignificant and the effect size was too small to represent even a small effect (g = 0.15). Contrary to Harper's apriori hypotheses, moderation analyses revealed that as children displayed higher levels of school and placement instability, inattention symptoms and academic self-

concept, the greater the gains they made on measures of reading, spelling, sentence comprehension and math. Likewise, children with higher risk-levels of having a diagnosis of ADHD also benefitted more from the tutoring intervention, as compared to children with lower levels of inattention. Although negative correlations were found between spelling and the ASEBA conduct disorder scale, and sentence comprehension and conduct disorder problems, a majority of the ASEBA-based behavioural and psychopathology symptoms were not significantly related to the foster children's academic outcomes. Harper (2012) concluded that the results from their study provided support for the effectiveness of a DI group-based tutoring curriculum with Aboriginal and non-Aboriginal foster children. Despite these promising results, there were several limitations for this study, including: a notably poor return-rate for the assessment questionnaires completed by the foster parents (i.e., the ASEBA), which impedes the interpretation and generalizability of the mental health results; fluency checks were not conducted, making it difficult to establish the level of implementation of the tutoring program across the volunteer tutors; and, finally, none of the academic or mental health measures used within this study had been standardized on an Aboriginal Canadian population.

Based upon the five studies reviewed, it appears as though academic tutoring aimed at improving the basic skills needed for academic success among foster children considered at risk for failure is an effective intervention. In fact, academic tutoring is one of the most popular forms of remedial instruction worldwide, and its effectiveness has been rigorously evaluated and extensively documented (Elbaum, Vaughn, Hughes, & Moody, 2000; Ritter, Barnett, Denny, & Albin, 2009). Furthermore, tutoring programs have an advantage over other remedial approaches in that they tend to be grounded in theory (Ritter et al., 2009). Interventions with the most empirical evidence are those that provide students with instruction in the precise academic

skills that are deficient, including, oral and written language skills or phonetic word decoding (Hinshaw, 1992). One of the most effective tutoring methods is Direct Instruction (DI), the same model of intervention upon which the *Teach Your Children Well* (Maloney, 1998) tutoring program utilized by Flynn et al. (2012) and Harper (2012; and Harper & Schmidt, 2012) in their studies. Thus, evidence supporting the use of DI-based tutoring programs will now be discussed.

The evidence supporting Direct Instruction-based tutoring programs. One of the most effective tutoring methods is Direct Instruction (DI). DI approaches academic skill remediation by teaching students at-risk for school failure the component skills needed to achieve particular target behaviours, while reinforcing the achievement of the target behaviours with a contingency-management approach (Dolezal, 2007; Ryder, Burton, & Silberg, 2006). More specifically, the DI model explicitly teaches reading mastery and mathematical skills needed to achieve academically, through the use of scripted lesson plans that are highly interactive and designed to help students achieve mastery as quickly as possible, while frequently assessing their skills to monitor their progress (Ryder et al., 20006). Furthermore, DI has a strong research base and has been demonstrated through multiple studies to be particularly effective at helping low-income, at-risk students to improve their reading and mathematical skills (Adams, 2006; Borman et al., 2003).

According to Adams (2006) and Bereiter and Kurland (1981-1982), the Follow-Through Project, one of the largest and most expansive educational experiments ever conducted, has helped to establish the efficacy of DI. Conducted over the course of 9 years (1968 through 1977), Follow-Through involved over 75,000 low-income at-risk children in 170 communities across the US. The purpose of the project was to evaluate nine school-based programs designed to help improve the education of economically disadvantaged students from kindergarten

through grade 3. Each of the nine programs was categorized into one of three basic-skills models: behaviouristic, cognitive-developmental, and psychodynamic (for a more detailed overview, see Adams, 2006). In general, the behaviouristic programs aimed to teach and reinforce specific social or academic skills deemed necessary to succeed academically (e.g., reading and mathematical skills); the cognitive-developmental programs promoted the children's cognitive experiences through engagement in classroom-based activities that were believed to enhance particular skills deemed essential for learning (i.e., problem-solving and verbal skills); and, finally, the psychodynamic-based programs emphasized the children's social-emotional development and focused on improving the child's self-esteem and peer interactions through teacher-provided opportunities.

Each of the nine models was implemented at 4 to 8 sites where children were starting in either kindergarten or the first grade. For each school in which Follow-Through was implemented, a comparison school in the same district was identified for which the children would serve as a "control group". The students were tested at entry into school and then at each subsequent spring until the third grade, using a variety of measures to assess the children's academic skills and progress, including the Wide Range Achievement Test. The outcomes for 9,255 Follow-Through children and 6,485 children from the comparison schools were included in the final analysis group.

The results revealed that, of the three categories of programs, the behaviouristic models demonstrated the most promising results. More specifically, two of the three behaviouristic programs elicited the strongest outcomes, namely, DI and Behavioural Analysis. Although the latter of the two programs produced significant outcomes for the children in the Follow-Through program, DI was by far the forerunner in eliciting the highest scores across all domains of

educational skills assessed, with an additional benefit of improving the children's self-esteem. Based upon the results, the lead investigators concluded that Direct Instruction-based programs can help at-risk children learn basic skills in reading, language, math and spelling, and to develop higher-order cognitive skills necessary to perform well in reading and math (Bereiter & Kurland, 1981-1982).

Since the Follow-Through project ended, its DI-based results have been replicated many times over, including in a meta-analysis conducted by Borman et al. (2003) in which DI was found to be one of the top three effective models for remediating the low-academic performance of urban students, producing an effect size of $d = 0.21$. Although two other models (i.e., Success for All program and the School Development Project) demonstrated higher degrees of effectiveness, DI was the only model that did not require a school-wide curriculum or a multisystem approach for implementation; that is, DI can be delivered on a one-to-one basis and, thus, implemented after school hours (Borman et al., 2003). Indeed, DI continues to be a highly-recommended program for assisting children who come from aversive backgrounds who have been deemed at-risk for academic failure due to its ability to be reliably implemented across a variety of settings (i.e., individually, in a small group, or across a whole school) and with children from demographically-diverse backgrounds (e.g., urban and rural populations, minorities, and students' whose first language is other than English) (Adams, 2006).

Several tutoring programs have been developed, based upon the principles of DI. As previously mentioned, one such curriculum is the *Teach Your Children Well* (Maloney, 1998). This Canadian tutoring curriculum utilizes the well-organized and structured methodology that is characteristic of DI programs and has been implemented both within the general public and in child welfare settings (see Harper & Schmidt, 2012 and Flynn, Marquis, Paquet, Peeke, &

Aubry, 2012 for further details), to enhance the reading, language and arithmetic skills of educationally-disadvantaged children. The *Teach Your Children Well* tutoring program will be described in greater detail in the Method section below. Having talked about the effectiveness of different forms of tutoring intervention aimed at improving foster children's academic skills, the discussion now turns to the effectiveness of different types of adult tutors.

Effectiveness of Different Types of Adult Volunteer Tutors

Adult-delivered one-to-one instruction has been touted to be one of the most popular approaches to tutoring. A majority of the research through the 1970s and 1980s focused on tutoring programs delivered by teachers and paraprofessionals, which demonstrated positive effects on children's reading and numeracy skills (Elbaum et al., 2000; Wasik & Slavin, 1993). However, many concerns were raised regarding the cost-effectiveness, efficacy, and sustainability of such programs (Wasik and Slavin, 1993). Through the 1990s and 2000s, there was a shift in focus, with research efforts concentrating on establishing the effectiveness of community volunteer tutors (Elbaum et al., 2000; Ritter et al., 2009). Although the research base supporting the effectiveness of tutoring programs using nonprofessional adult tutors has yet to match that of professional volunteers, the results thus far are promising (Ritter et al., 2009; Slavin, Lake, Davis, & Madden, 2011).

A thorough search of the extant literature revealed six major reviews of the research investigating the impact of adult volunteer tutoring programs on children's academic outcomes: Shanahan (1998), Wasik (1998), Elbaum et al. (2000), Erion (2006), Ritter et al. (2009), and Slavin et al. (2011). However, due to methodological difficulties, the reviews conducted by Shanahan (1998) and Wasik (1998) will not be discussed.

Elbaum et al. (2000) conducted a meta-analysis on the effectiveness of volunteer adult-delivered, one-to-one instructional tutoring programs for improving the reading skills in elementary school-aged children deemed at risk for reading failure. Based upon a sample of 29 studies conducted between 1975 and 1998, the authors reported that when trained, volunteer adult tutors, using direct instruction methodologies, were effective in helping students improve their reading skills. Although the strongest effect was found for Reading Comprehension (d = 2.41), the students' decoding, oral reading and composite scores, based on subtests of different skills, also yielded moderately positive effect sizes (d = 0.41 to 0.51). Of interest, while the total instruction time was not found to be reliably associated with effect size variation, the duration of interventions was reliably associated with variation in effect sizes, with programs that lasted up to 20 weeks generating stronger effects (d = 0.65), than those that lasted longer (d = 0.37). Based upon their findings, Elbaum et al. concluded that not only was the magnitude of the effects generated "great enough to allow the students to keep up with classroom instruction and to avoid academic failure", but that "college students and trained, reliable community volunteers [are] able to provide significant help to struggling readers" (p. 616).

In an attempt to establish a reliable estimate of the impact of parent tutoring, Erion (2006) consulted the published and unpublished literature and reviewed 37 studies conducted between 1970 and 2004. Even though much of the research investigating the effects of parent tutoring was been plagued by poor study designs and vague descriptions of the tutoring intervention characteristics, the results of Erion's (2006) review provided support for the notion that parent tutoring is an effective intervention for improving the academic skills of children (d = 0.55). In particular, children showed improvement across all domains, but had higher mean gains in word recognition and math calculation than in reading fluency and spelling.

Erion (2006) also analyzed tutoring program characteristics to identify any moderating effects on children's outcomes and found that the duration of training sessions was significant. That is, when parents attended longer training sessions, the effects were greater (d = 0.67) than when the parents received shorter training sessions (d = 0.18). However, it was cautioned that duration in and of itself likely did not explain this finding; indeed, Erion stated that duration of training alone does not imply that parents benefitted from the program and that a better gauge of efficacy of training would be whether parents received corrective feedback and achieved mastery of the skills taught during the training. However, based upon his review, Erion noted that few, if any, studies included such information. Based upon the results, it was concluded that when parents engage their children in tutoring interventions more frequently and for longer periods of time, the children appear to benefit more. Several other authors have also conducted similar reviews and have also found results that are consistent with and support Erion's (2006) findings (e.g., Bempechat, 1992; Fishel & Ramirez, 2005; Toomey, 1993).

Ritter et al. (2009) conducted a recent, rigorous review of studies published between 1985 and 2005 that investigated the effects of adult volunteer tutoring on the reading and math abilities of primary school-aged children in the general population, and synthesized the results. Adult volunteer tutors were classified as college students, community volunteers or parents. The results generated from the review of 21 studies indicated that adult, nonprofessional volunteer tutoring was effective in improving children's progress in language and reading, for which statistically significant small to moderate mean effect sizes were found on global reading (d = 0.26), reading oral fluency (d = 0.30), reading letters and words (d = 0.41), and writing (d = 0.45). Also, positive (but not statistically significant) effects were found on mathematics and reading comprehension outcomes. High-structure programs that specified the amount of time to

spend on various reading activities or provided tutors with specific materials and lessons to administer had significantly higher mean effects (d = 0.59) on the outcome of global reading than low-structure programs that were either nondirective or in which the tutor and child simply read together (d = 0.14). The degree of program structure did not appear to influence, however, the effects on the other reading outcomes. Also, the type of tutors (i.e., college-age, community, or parent tutors) was unrelated to the children's outcomes. In conclusion, the authors noted that tutoring by adults can be an affordable way to improve the basic skills and supplement the learning of students at risk of academic failure.

In their review of the tutoring literature published between 1970 and 2009, Slavin et al. (2011) sought to establish whether one-to-one tutoring programs elicited better reading outcomes than group-based tutoring when delivered by teachers, paraprofessionals, or adult volunteers. In all, 97 studies met criteria to be included in the study. The results indicated that, as compared to small-group tutorials, one-to-one tutoring that places an emphasis on phonics is the most effective means of intervening with elementary school-aged children who are lagging behind in reading. Although teachers were determined to be the most effective type of tutor (d = 0.39), paraprofessionals and adult volunteers are also effective in eliciting promising reading outcomes (d = 0.24), with the positive effects lasting into children's upper elementary grades.

The findings of the systematic reviews and meta-analyses by Elbaum et al. (2000), Erion (2006) Ritter et al. (2009), and Slavin et al. (2011) provide several grounds for advancing the hypothesis that academic tutoring, by foster parents, may prove useful for helping to improve the academic skills of young people in care. Although the aforementioned studies were based on research on tutoring in the general population, there is no obvious reason why tutoring should not work in the foster care context as well. This is especially true in light of the finding by Ritter et

al. (2009) that tutoring by parents was as effective as tutoring by other types of volunteer adults, namely, high school and college students or retired individuals.

Based upon the findings of Flynn et al. (2012) and Harper (2012) already presented, tutoring by foster parents has, on a preliminary basis, been proven effective in improving foster children's basic academic skills. These results offer at least two important advantages. First, they capitalize on the potential of a ready and relatively untapped resource—foster parents—to contribute to the educational progress of their foster children. This is consistent with Jackson's (2007) advocacy of a much greater role for foster parents in the academic education of their foster children. Certainly, the improvement of foster caregivers' involvement and abilities to provide meaningful intervention and support to their foster children is also a viable solution within the context of an over-stressed child welfare system (Horwitz, Chamberlain, Landsverk, & Mullican, 2010).

Second, in being based in the foster home rather than in the school, tutoring by foster parents complements rather than competes with current efforts in Ontario and other jurisdictions to make schools and school systems more hospitable to children and adolescents in care. In Ontario, such efforts have taken the form of Crown Ward Education Championship Teams, in which youths with Crown Ward status receive mentorship, peer support, motivation, and guidance from volunteer representatives across multiple community organizations, including school boards, colleges, universities and other agencies serving youth (Ontario Association of Children's Aid Societies, 2007).

Indeed, there are several advantages of having parents' explicit engagement in their children's academics and having parents acting as tutors is one potential way of being involved. Taking for granted that foster parents are similar to parents in the community, and with minimal

training they would be more similar to adult volunteers than trained tutors, tutoring of foster children by their foster parents may also generate some of the same benefits reported amongst children in the general population whose parents are explicitly involved in their academics. Thus, we now turn to research that demonstrates some of the benefits of parental involvement on children's academic achievement.

Benefits of parental involvement on children's academic achievement. According to the literature, family involvement is one of the most neglected yet powerful supports for children's learning, both in and out of school (Weiss, Bourffard, Bridglall, & Gordon, 2009). Literature pertaining to young people in the general population indicates that educational interventions delivered by a parent or caregiver, such as tutoring, provide opportunities for the young person to receive individualized attention, which helps to promote positive self-perception and resilience (Hawkins et al., 1999; Smokowski, 1998). Furthermore, parental involvement in their children's academics, in general, helps convey that education is valued, which is believed to foster higher motivation, perceived self-competence and expectations, and effort (Weiss et al., 2009). In general, it appears as though parents are more likely to become involved in their children's academics if they perceive that their involvement will have a direct positive impact on their children (Goodall & Vorhaus, 2011).

Synthesizing the literature, Jeynes (2003; 2005) noted that parental involvement in children's academic achievement resulted in positive educational outcomes, such that as the children's academic achievement improved, parental involvement increased. However, this effect was greater in elementary school than in secondary school. Jeynes also stated that these positive effects were seen regardless of the level of parental education, social economic status, or racial heritage. In his 2005 meta-analysis, Jeynes found that when the impact of parental

involvement was considered by gender, the overall effect sizes were in the moderate range for both boys and girls.

Unfortunately, research on the effects of parental involvement on children's academic achievement appears to be fragmented, and the findings seem inconsistent, in good part due to the lack of a consistent theoretical framework (Fan & Chen, 2001; Nye, Turner, & Schwartz, 2006) or a clear and concise operational definition of parental involvement (Jeynes, 2003, 2005; Nye et al., 2006). For example, parental involvement may be defined in multiple ways, from communicating aspirations about academic achievement to their children to direct involvement in school activities or involvement in home-based learning (Fan & Chen, 2001; Hoover-Dempsey et al., 2001).

Despite these limitations, a number of studies have clarified the effects of parental involvement on children's academic achievement and which aspects of parental involvement are most effective in producing positive results. For example, Nye and his colleagues (2006) provided a relatively up-to-date systematic review and meta-analysis of controlled research on the effects of parental involvement on elementary school children's academic achievement. Defining parental involvement as reflecting "the implementation of a program in which the parent has a direct interaction with the child in either the delivery or monitoring of the program of intervention" (p. 14), 19 randomized controlled trials were reviewed. Nye et al. found a mean effect size of $d = 0.45$, which, in their opinion, provided compelling evidence for the notion that when "parents participated in academic enrichment activities with their children outside of school, the benefits were manifest in improved academic performance in school" (p. 24). These results were particularly remarkable considering the median length of parental involvement was only 11 weeks.

Nye et al. (2006) also found that parental involvement had the greatest impact on children's reading performance ($d = 0.41$), suggesting that children's literacy improved when parents participated in reading activities with their children outside of school. In contrast, parental involvement did not significantly improve their children's overall math achievement.

In a study of 193 elementary school children (i.e., Grades 2 through 5) in the US, Zellman and Waterman (1998) found that parents' involvement in their children's education was associated with better test scores in reading and fewer teacher-rated learning problems. Moreover, parents who became involved in their children's education were enthusiastic about their involvement and motivated by a perception that their children needed help. Zellman and Waterman also emphasized that *how* parents interact with their children is important in predicting the children's academic outcomes.

In order to become involved in their children's academic, parents often need certain supports. For example, Epstein (1988) recommended that in order to help parents act as an academic resource for their children, they need to be supported to create a home environment that is conducive to learning, encouraged to engage in frequent and clear communication with school staff (e.g., teachers, tutors, program coordinators) about their child's progress, and encouraged to become involved in their children's other school activities as well. These suggestions are consistent with those made by other authors, including Caspe, Lopez, & Wolos (2006-2007) of the Harvard Family Research Project.

Additional benefits of parental involvement cited in the literature include enhanced communication and improvement in the overall parent-child relationship (Hawkins et al., 1999; Smokowski, 1998). When the relationship improves, there are greater opportunities for parents to help build trust, emotional support, and open communication with the children, features that

have been associated with positive behaviour, self-perception, academic expectations and achievement (Weiss et al., 2009).

To anticipate the present study, the foregoing findings provide a basis for predicting that children in foster care will benefit not only academically from tutoring from their foster parents but also in terms of an improved foster parent-foster child relationship, improved foster child self-perception and a more optimistic perspective about the foster child's capacity to achieve academically via an improvement in their basic academic skills in reading and math. However, based upon Slade and Wissow's (2007) and research already reviewed, it is possible that as foster children achieve gains in their basic academic skills, their mental health may also be positively impacted. Thus, the last section of the literature review now turns to exploring the possible 'spillover effects' of tutoring on foster children's mental health.

Possible 'Spillover Effects' of Tutoring on Foster Children's Mental Health

In addition to assessing the effectiveness of tutoring by foster parents on improving foster children's academic skills, the present study was also interested in exploring the possibility that the intense interaction between foster parent and foster child that tutoring involves may have important mental-health 'spillover effects'. That is, tutoring may improve the child's mental health by enhancing his or her academic self-perception or promoting a closer relationship with the foster parent-tutor. To the best of our knowledge, few attempts have been made to directly examine this question in the general-population tutoring research and in the virtually nonexistent foster-population tutoring research.

With regard to the general population literature in which tutoring interventions aimed at specifically improving children's academic performance, two studies have been noted to have elicited positive benefits in decreased hyperactivity (Ayllon, Layman, & Kandel, 1975), and in

classroom behaviour and peer acceptance/relationships (Coie & Krehbiel, 1984). Based on these findings, Hinshaw (1999) suggested that direct amelioration of children's academic skills may also have reciprocal effects on social competence, which may be mediated through the enhancement of improved adult and peer relationships and increased self-esteem.

Within a child welfare context, the more recent results presented by Tideman et al. (2011) help sustain the notion that academic intervention can also improve children's mental health. More specifically, in their two-year study, Tideman et al. sought to improve the academic achievement of 24 foster children, aged 7 through 11 years, living in long-term family foster care in Sweden, through individualized educational support. As part of the initial evaluation, the foster children's cognitive ability and literacy and numeracy skills were assessed, and their foster parents and teachers completed two commonly-used questionnaires to assess behavioural difficulties in children (i.e., Beck Youth Inventories and the Strengths and Difficulties Questionnaire). The results of the assessment were used to develop an individualized plan for educational support, which was implemented, with adjustments as needed, over the course of the study. By the end of the second year, all of the foster children demonstrated significant improvement in their average reading and spelling skills (although they made positive gains in their numeracy skills, the results were nonsignificant), and were also exhibiting enhancements in their social-relational skills with their peers, foster parents, and teachers. However, the children's scores on the other measures of mental health did not improve over the course of the two years, with their scores remaining in the normative range. Tideman and colleagues (2011) concluded that the children's academic difficulties had stemmed from a gap in knowledge that had accumulated over the years, rather than from low intelligence or behavioural difficulties; these gaps had been filled through the receipt of focused academic support.

In the relative absence of data bearing directly on the question of possible mental-health benefits of tutoring, indirect evidence is provided by a recent meta-analysis by Durlak and Weissberg (2007) of the effects of 73 after-school programs (ASPs) on personal, social, and academic outcomes. Relevant to the current study's "spillover" hypothesis, Durlak and Weissberg found that programs aimed at improving academic outcomes can have important social/personal (i.e., "mental health") benefits, and vice versa. More specifically, programs that were evidence-based and that were "SAFE", that is, based on a *sequenced,* step-by-step training approach, emphasized *active* forms of learning to promote the practice of new skills, *focused* on specific skill training, and provided *explicit* training goals (i.e., targeting specific skills), were associated with statistically significant and clinically meaningful outcomes. These benefits included improvements in participating youths' academic self-perception, school bonding, positive social behaviour, improved school grades, and scores on achievement tests, and a significant reduction in problem behaviour. Drug use and school attendance were the only two outcomes in Durlak and Weissberg's meta-analysis on which statistically significant reductions were not observed. Programs that did not have all four SAFE characteristics, on the other hand, elicited mean effects that were not statistically significantly different from zero.

The SAFE after-school programs that targeted children's academic achievement test scores produced a mean effect of $d = 0.20$. Although this denotes a small effect size, nonSAFE programs had a nonsignificant mean effect that was very close to zero ($d = 0.02$). Thus, the SAFE academically oriented programs were associated, on average, with positive and practical gains. The SAFE programs also had a positive, significant mean effect on the children's social behaviours ($d = 0.29$) and reduced problem behaviours ($d = 0.30$). The nonSAFE programs, in contrast, had average effects in these same domains that were not significantly different from

zero (d = 0.06 and d = 0.08, respectively). These findings were replicated by Durlak, Weissberg and Pachan (2010) and Durlak, Weissberg, Dyminicki, Taylor, and Schellinger (2011). To anticipate the tutoring intervention used in this thesis, these results suggest, overall, that a tutoring intervention that incorporates all four SAFE characteristics—that is, that is sequential in nature, promotes active learning, focuses on specific competencies skills to be acquired, and is explicit about which learning objectives are targeted—is likely to promote academic progress and possibly social and personal adjustment as well.

Although academic achievement and personal/social competencies appear to be linked, the precise nature of their relationship is often unclear. Durlak and Weissberg (2007) suggested four possibilities: children's academic gains may precede personal/social skill development, personal/social skill development may precede academic improvement, academic and personal/social improvements may occur simultaneously, or an extraneous third factor may promote both types of changes. At this time, it does not appear as though any studies have directly sought to clarify the exact nature of the association.

Having demonstrated the bidirectional association between academic achievement and mental health, documented the poor academic attainment of foster children, provided some evidence of the efficacy of tutoring programs aimed at improving foster children's academic achievement, the current study will now be presented.

Present Study: The RESPs for Kids in Care Project

Considering the frequency with which foster children's low educational achievement is the subject of descriptive accounts in the literature, it is surprising that virtually no controlled interventions have been conducted to improve their academic skills (Barth & Ferguson, 2004; Trout et al., 2008). Trout and her colleagues felt that many young people in care would require

intensive educational assistance to address their difficulties. They also advocated that future research investigate the effects of evidence-based interventions and use standardized achievement tests as outcome measures, in specific academic areas such as receptive or expressive language, reading comprehension, or math calculation.

In the UK, educational achievement has become a key policy issue, and Jackson (2007) has advocated for an increase in research to explain and explore the basic reasons for the "huge and persistent gap in attainment between care leavers and others" (p. 4). Jackson has drawn attention to the vital role that foster parents can play in enhancing the educational performance of young people in care. She added that the failure to emphasize the education of young people in care has characterized not only the UK but also in the US, Australia, and Canada.

Encouragingly, the underrepresentation in post-secondary education (PSE) of young people who are still in foster care or who have recently graduated from it has come to the attention of the Ontario government. Since the fall of 2008, Crown wards (i.e., young people living in long-term out-of-home care) have their PSE application fees waived and receive a grant covering up to $3,000 of their first year tuition and an additional $3,000 grant if registered in a program of more than 24 months duration (Ontario Ministry of Training, Colleges, and Universities, 2007).

While financial support for PSE from governments is praiseworthy, the bases of educational success must be laid down much sooner, in early childhood and the primary school years. Given the current lack of evidence-based interventions to improve the educational outcomes of young people in care (Trout et al., 2008), Jackson's (2007) suggestion that foster parents be engaged in their foster children's education, and widespread governmental interest in improving the educational outcomes of young people in care as a strategic priority, the current

RESPs for Kids in Care project was especially timely. It sought to test the main hypothesis that academic tutoring provided by foster parents to their foster children of primary-school age will improve the children's reading and math skills. It also sought to test the auxiliary hypothesis that such tutoring will enhance the foster parent-foster child relationship and improve the children's mental health. The shorter-term goal of the project was to enhance the foster children's chances of succeeding in primary school; the longer-term goals was to improve the foster children's high school success and thereby increase their eventual enrollment in and graduation from PSE programs, whether in university, college, or trade/apprenticeship settings. With the exception of the ESTEP Tutoring program evaluated by Courtney et al. (2008), the *RESPs for Kids in Care* project was one of only two studies of which we are aware (the other being by Harper, 2012) that used a randomized design to assess the effects of tutoring (or any other intervention to improve educational outcomes) among children in care (see Forsman & Vinnerljung, 2012).

Study Hypotheses and Research Question

As is further described in the Method section, 77 children in primary school (i.e., grades 2 through 7), residing in family foster care and who had also given their written assent to participate, were randomly assigned to either an experimental or a wait-list control group. Those assigned to the experimental group received a Registered Education Savings Plan (RESP) *and* a 30-week program of tutoring from their foster parents that was designed to improve their basic reading and mathematical skills. Those randomized to the control group received only the RESP. The intent was to evaluate the effects of the tutoring intervention on the foster children's academic skills and mental health. The study lasted for two school years; however, the second year served mainly to enable the wait-list control children to receive the 30-week tutoring

intervention. Therefore, the analyses herein focused solely on the first year of academic tutoring by foster parents.

As noted earlier, Flynn et al. (2012) had previously conducted, via ANCOVA and in the research sample as a whole, a test of the main hypothesis of the *RESPs for Kids in Care* project, namely, that the tutoring intervention would produce gains in the academic skills of reading and math. Accordingly, this thesis, the second study based on the same project as Flynn et al. (2012), conducted an additional test of this main hypothesis, that: *The tutoring intervention will lead to greater gains in reading and math than the wait-list control condition*, using a different data-analysis method (i.e., through repeated-measures ANOVA with follow-up paired *t*-tests), with an expectation that the results would be similar but not necessarily identical to those previously reported in the study by Flynn et al. (2012). Although this reanalysis of the project data was not essential per se, it was conducted in the interest of completeness and thoroughness to determine whether a new analytical technique (i.e. repeated-measures ANOVA) would elicit new or different results from those reported by Flynn et al. (2012). There were several benefits to this reanalysis, including: the ability to maintain the same analytical technique that was applied to the gender analyses; the benefit of keeping the foster children's original pretest scores such that the actual impact of the tutoring gains from their 'real' starting points could be determined, which is in contrast to the artificial adjusting of the experimental and control group foster children's pretest scores in the ANCOVA analyses; and obtaining the growth curves to aid in the interpretation of the results, as well as the interactions between the variables.

While re-examining this hypothesis, the present study also had different main purposes, namely, to investigate: (a) whether gender moderated the impact of the tutoring intervention (i.e., did the girls and the boys in the foster-care sample experience similar gains in reading and

math from tutoring?); (b) whether the tutoring intervention had any impact on the foster children's mental health (i.e., on their inattention/hyperactivity, internalizing problems, externalizing problems, or relationship with their foster parents?); and (c) whether the effect of tutoring was moderated by other variables, such as the level of implementation fidelity or the foster children's mental health. All three of these areas are necessarily exploratory because of the sheer lack of relevant literature upon which formal hypotheses could be formulated. For example, the investigation of the potential role of gender in moderating the impact of the tutoring intervention in the RESPs for Kids in Care project was original but also exploratory, because neither in the tutoring research conducted in the general population (Ritter et al., 2009) nor in that carried out among young people in care (Courtney, 2008; Flynn et al., 2012; Harper & Schmidt, 2012; Harper, 2012), had the role of gender as a moderator of the effects of tutoring ever been examined. For these aforementioned reasons, the issue of gender as a moderator was posed as a working hypothesis due to the fact that there was very little basis upon which a formal hypothesis could be formulated, as it appears as though only one other study (i.e., Kirk et al., 2012) has ever investigated the issue of gender differences in the educational outcomes of foster youth. Likewise, the examination of whether the academic tutoring intervention had any "spillover" effects on the foster child's mental health and relationship with his or her foster parents were also posed on an exploratory basis was because no previous research, to the best of our knowledge, had looked for such spillover effects. At best, the research literature (e.g., Durlak & Weissberg, 2007; Slade & Wissow, 2007) had pointed in the direction of a reciprocal association between academic and mental health outcomes. Accordingly, a series of exploratory working hypotheses were formulated, which included the potential role of gender in accounting for differential outcomes. These working hypotheses were as follows:

Working Hypothesis 1: *The foster girls in the experimental (tutoring) group will demonstrate greater gains in their reading and math skills at post-test, compared with the foster boys in the experimental group.*

Working Hypothesis 2: *The foster children in the experimental group will show a greater mean pre-test-to-post-test decrease in inattention/hyperactivity, compared with the foster children in the wait-list control group.*

Working Hypothesis 3: *The foster children in the experimental group will show a greater mean pre-test-to-post-test decrease in internalizing and externalizing behaviour, compared with the foster children in the wait-control group.*

Working Hypothesis 4: *The foster children in the experimental group will report a more favourable academic self-perception at the post-test, compared with the foster children in the wait-list control group.*

Working Hypothesis 5: *The foster children in the experimental group will report a closer relationship at the post-test with the foster parents who tutored them, compared with the foster children in the wait-list control group.*

Working Hypothesis 6: *The foster parents who tutored the foster children in the experimental group will report a closer relationship at the post-test with their foster children, compared with the foster parents in the wait-list control group.*

Exploratory research questions. Several other questions were posed that were worth exploring, due to an interest in the understanding if there was any direct effect or impact of moderation on the educational and mental health results. However, once again, due to a lack of previous research there were no apriori expectations regarding the outcomes and, thus, no formal hypotheses were formulated. The following questions are all posed with specific regard to the

foster children in the experimental group only, as they are the ones who received the academic tutoring intervention over the course of the first intervention year:

1. Do the foster children who were recruited as a single child achieve greater gains in their reading and math skills, as compared to the foster children who were recruited as a sibling pair?
2. Does the level of implementation fidelity moderate the effects of tutoring on the foster children's reading and math skills?
3. Does the foster child's initial level of ADHD moderate the effects of tutoring on his/her reading and math skills?
4. Does the foster child's initial level of overall mental health problems moderate the effects of tutoring on his/her reading and math skills?
5. Do the foster child's gains in reading or math skills have a direct effect on his/her mental health outcomes?
6. Do the foster children in the experimental group who received a greater number of sessions report greater gains in reading and math skills?
7. Do the foster children in the experimental group who were more cooperative during the tutoring report greater gains in reading and math skills?
8. Do the majority of foster children in the experimental group report qualitatively, at the post-test, that they experience greater ease in reading and math than previously?
9. Do the majority of the foster parents in the experimental group report qualitatively, at the post-test, that they perceive a positive impact of the tutoring on their foster child's emotional well-being and behaviour?
10. Do the majority of the foster children and foster parents in the experimental group

report qualitatively, at the post-test, that they experience a closer parent-child relationship?

11. What were the reactions of the foster parents and children of their experience with the Teach Your Children Well tutoring program?

Given that the tutoring trial was oriented mainly to educational outcomes and only secondarily to mental health outcomes, the findings of the formal research hypothesis will be presented first, before the results of the working hypotheses and exploratory research questions.

METHOD

The project on which the present study was based, the *Registered Education Savings Plans (RESPs) for Kids in Care*, was designed to evaluate, primarily, the effects of academic tutoring by foster parents on the academic skills in reading and math of their foster children of primary-school age and, secondarily, the possible 'spillover' effects of tutoring on the foster children's mental health. The project was an effectiveness trial, conducted under real-world conditions, rather than an efficacy trial carried out under near-ideal, laboratory conditions. The study was approved by the Social Sciences and Humanities Research Ethics Board of the University of Ottawa.

Participants

Nine of the 53 Children's Aid Societies (CASs) in Ontario agreed to collaborate in the study. These CASs were located in several different regions of the province: 3 in Northern Ontario and 2 each in Southwestern, Central, and Eastern Ontario. Within each collaborating CAS, direct service staff members (i.e., child welfare workers and their supervisors) nominated foster child-parent pairs who would be willing to participate in the tutoring intervention. The nominated foster children were those seen as likely to benefit from the tutoring, and their foster

parents as those who would likely be able to deliver the intervention. The research team chose foster parents to deliver the tutoring program because they are already available on an ongoing basis and actively involved in their foster children's lives. Also, Erion (2006) and Ritter et al. (2009) found that parents were as effective as other types of adults in tutoring their own children.

Foster children. Seventy-seven children who were residing in family foster care within the collaborating CASs assented to participate in the study (see Appendix A). In order to participate, each child had to have met the eligibility requirements (see Appendix B). In brief, they had to be in grades 2-7, have English as their primary language, be in a stable foster home or kinship care placement, and be viewed by their worker as likely to benefit from the intervention (i.e., as being neither too intellectually impaired nor too behaviourally disturbed to profit from tutoring). At the pre-intervention assessment (i.e., in September/October, 2008), the 77 foster children were between the ages of 6 and 13 years (M = 10.7 years, SD = 1.6) and were in primary school grades 2 through 7 (M = 5.3 years; SD = 1.5). Forty-two foster children were randomly assigned to the experimental group (50.0% male, 50.0% female) and 35 to the wait-list control group (42.9% male, 57.1% female).

Foster parents. For particular foster children to be eligible to participate in the study, at least one of their respective foster parents had to be recommended by CAS staff, pass a literacy placement test, agree to tutor one (or, in a few cases, two) of their foster children for a total of 3 hours per week for 30 weeks during the school year, and give their informed consent (see Appendix A). In total, 68 foster parents (63 female, five male) met the study inclusion criteria (see Appendix B); 36 were randomly assigned to the experimental group and 32 to the wait-list control group, and ranged in age from their 20s through to their 60s, with most of the foster parents reporting to be in their 40s and 50s. The majority of the foster parents had completed

high school or community college. A female foster parent was reported to be the primary caregiver for 92.9% of the foster children in the experimental group (who would also act as the primary tutor) and 91.4% of the children in the wait-list control group, respectively.

Most of the foster parents who expressed an interest in participating in the current study were encouraged to tutor only one foster child; in Ontario, foster homes may house a maximum of four foster children. However, to maximize recruitment, a small number of foster parents who wanted to tutor two eligible children were permitted to do so, with the understanding that each foster child was to be tutored individually, to maximize the potential impact of the intervention while also minimizing any potential confounds resulting in having two children tutored together. In one exceptional case, two foster-parent tutors in one home were permitted to tutor three foster children. In all, 69% of the foster children in the experimental group and 71% of the foster children in the control group were the only ones tutored in their particular foster homes.

Power analysis, research design and randomization. To determine the number of young people in foster care needed, an a priori power analysis using the G*Power 3.1 program (Faul, Erdfelder, Lang, & Buchner, 2007) was conducted. The test-retest correlation coefficient for each of the WRAT4 subtests was used to calculate the minimum number of foster children required to detect a medium effect of $f = 0.145$[3] with 80% power and an alpha level of .05. The power analyses indicated that a test of the groups-by-time interaction in a repeated-measures ANOVA would require a minimum sample size of 18 foster children to detect a medium effect for the WRAT4 Spelling ($r = .76$) subtest, which had the lowest correlation coefficient and a minimum sample of 48 foster children for the Math Computation subtest ($r = .92$), which had the highest correlation coefficient. Therefore, according to the power analysis, the current study's

[3] The *f* of 0.145 was used because it is equivalent to a Cohen's *d* of 0.29, which is the median effect size found in randomized educational interventions, according to Lipsey et al. (2012), Table 10, p. 36. See the discussion of this point later in the Method section of this thesis, pp. 92-93.

sample size (N = 64) was well-above the required sample sizes for all of the WRAT4 subtests.

The current study used a pre-test/post-test control group design. Several weeks prior to the pre-test, in preparation for the random assignment of participants to each treatment condition, a permuted-blocks randomization procedure (Beller, Gebski, & Keech, 2002) was used to ensure that there would be a relatively equal division of the different types of foster parent-foster child pairs between the experimental and control groups. More specifically, the sample of participants was divided into 6 categories or "strata" of foster parent-foster child pairs. A single foster-parent tutor was paired with the following categories of foster children: (a) one girl, (b) one boy, (c) 1 girl and 1 boy (from the same foster home), (d) 2 girls (from the same foster home), (e) 2 boys (from the same foster home), and, in one case, (f) three boys (from the same foster home). For each foster parent-foster child pair, an envelope was prepared and then, within each stratum, a table of random numbers was used to randomly assign each envelope to the experimental or wait-list control group. A slip of paper was inserted into the envelope to indicate to which group the eventual recipient pair would be assigned, and the envelope was then sealed, only to be opened at the pre-test immediately after the parents and foster children had signed their respective consent forms. This randomization procedure ensured that the number of parent-child pairs in the experimental and control conditions would be as equal as possible and allowed for cases in which two or more children in the foster home participating in the study to be assigned to the same condition. This, in turn, made the tutoring logistically feasible and eliminated the risk, within any given foster home, of leakage from one condition to the other.

Interventions

Wait-list control intervention: Registered Education Savings Plan (RESP). During the first intervention year (2008-2009), the foster children in both the control and experimental

groups received an RESP from their respective CASs for their future postsecondary education (PSE). Under the auspices of the Canada Education Savings Plan (CESP) of Human Resources and Skill Development Canada (HRSDC), RESPs are financial accounts in which parents and others can invest funds for a child's future PSE. Each participating CAS had committed itself to opening an RESP for each of its foster children in the study and depositing $500 in his or her RESP in each year of the study, for a total of $1,000. The federal government provided matching funds of $200 each year, for a total of $400 (i.e., a 40% match). Each child in the study thus was assured of receiving $1,400 in his or her RESP. These and any additional funds received in the future will garner interest on a tax-free basis until eventually used by the child, at age 18 years or later, for postsecondary educational expenses. The foster parents in the control and experimental groups received basic information about RESPs and agreed to communicate weekly or more often to their foster child that the RESP was both a symbol of his or her great value and an investment in his or her future.

Experimental intervention: Foster-parent tutoring using the Teach Your Children Well program. In addition to the RESP, the foster children in the experimental group received the *Teach Your Children Well* (*TYCW*; Maloney, 1998) tutoring intervention during intervention year one. The project within which this study was conducted is one of the first known evaluations of one-on-one direct instruction with a foster care population and the first controlled assessment of the impact of the *TYCW* operationalization of the approach.

The *TYCW* (Maloney, 1998) tutoring program that was evaluated was intended to provide three hours a week of individual tutoring to each foster child, for 30 weeks. The three hours consisted of two hours of one-to-one direct instruction in reading (which could be divided into multiple shorter lessons throughout the week, at the discretion of the foster parent and child), 30

minutes of reading aloud to the foster parent tutor (or another adult), and 30 minutes of supervised, self-paced instruction in math. The math component was taught through step-by-step instruction in the form of a computer-based CD-ROM that the foster child followed at his or her own pace. The reading component consisted of a four-level learn-to-read series of books. For each level of the reading series, there was a detailed instructor's manual and a student reader, and for some levels, there was a student workbook. As part of the *TYCW* program, after the children learn the basic skills associated with their reading lesson, they complete a fluency test in which they are required to accurately pronounce a certain number of written words within one minute. If the child is able to achieve the target number of words, she/he would be considered to have achieved 'mastery'; if they did not, they would need to repeat the lesson until such time that mastery was achieved. Further, in addition to the structured tutoring time, the *TYCW* program encourages the children to read aloud to an adult between tutoring sessions as a way to practice their reading skills.

For the current study, to determine at which level of the *TYCW* program the foster child should begin, his or her current reading level was determined by means of an assessment passage (see Appendix C). The foster children began by reading the Level 1 passage aloud. If they made four or more mistakes, they started the program at Level 1. If they made fewer than four mistakes, they read aloud the assessment passage for Level 2, and so on, until their reading level had been identified.

To teach and promote behavioural self-regulation, the *TYCW* program also incorporated a behaviour-management component, to help motivate the foster children to maintain appropriate behaviour during each lesson to optimize learning. The behaviour management component used a reward system, in which the child was to be awarded points for positive behaviour in a given

tutoring session. The child could collect a predetermined number of points, agreed upon with the tutor, which could be redeemed for a reward (e.g., playing on the computer).

The *TYCW* program was selected for use in the current study because it capitalizes on the strengths and benefits of being a direct instruction-based program, combined with a contingency management component. The program also holds promise of being an effective intervention promoting academic progress and social and personal adjustment for foster children at risk of academic failure, as it features the SAFE characteristics previously highlighted by Durlak and Weissberg (2007) as being important components of effective after-school programs. More specifically, *TYCW* is: *sequenced* through its emphasis on step-by-step training of the basic skills necessary for reading and arithmetic; promotes *active* forms of learning that encourages the practice of skills through the fluency tests and reading aloud to an adult; is *focused* on the specific skills it is teaching (e.g., phonetic sounds, addition/subtraction); and encompasses *explicit* training goals (e.g., to read a target number of words within a specified period of time, such as a minute).

In addition to the curriculum-related factors, the manner in which the *TYCW* program was implemented incorporated a number of the suggestions put forth by Epstein (1988), as discussed earlier, to promote and encourage foster parent involvement in their foster children's academics. That is, foster parents were used as the resource to administer the tutoring program; they were asked to set aside a time and location, within their home, that would be conducive to administering that tutoring curriculum; they were to have frequent and clear communication with the project coordinator regarding their foster children's progress and were encouraged to contact the author of the *TYCW* curriculum if any problems or concerns arose (as discussed further in the 'Procedure' section below); and they were encouraged to talk to their foster children's teachers

about the tutoring program so that the teachers could help support the process. It was hoped that in implementing these factors, foster parents would become actively engaged in the tutoring process and with the foster children's academics in general.

As previously mentioned, the young people randomly assigned to the experimental group received the RESP intervention *plus* 30 weeks of foster-parent tutoring in both years of the study (i.e., throughout 2008-2009 *and* 2009-2010 school years). All young people were supplied with as many levels of the tutoring program as they were able to complete necessary throughout the duration of the study, made possible by the project budget.

Instruments

Following the recommendation of Trout et al. (2008), standardized measures of academic achievement were used to assess the foster children's acquisition of basic reading and math skills. Standardized measures were also employed to assess the children's mental health.

Test of Word Reading Efficiency (TOWRE). The TOWRE[4] (Torgensen, Wagner, & Rashotte, 1999) is a standardized test that assesses word reading accuracy and fluency among individuals between the ages of 6.0 years and 24.11 years. Two alternate forms of the test are available (i.e., Forms A and B), which are equivalent in structure and difficulty. Form A was used for the purposes of the current study as a warm-up for the children before administration of the measure of academic achievement, the Wide Range Achievement Test (WRAT4), described below. The test is composed of two subtests, each of which is administered in 45 seconds. The first subtest on the TOWRE, Sight Word Efficiency, requires the individual to read aloud sight

[4] It was our original intention to use the TOWRE as a measure of the foster children's reading fluency. However, all three members of the project team found the instrument difficult to administer to the sample of foster children, particularly those with substantial educational difficulties. Also, the post-test analyses at the end of year 1 indicated that the TOWRE was insensitive to change, unlike the main measure of academic skills, the Wide Range Achievement Test (WRAT4). Thus, we retained the TOWRE at the post-intervention and follow-up assessments as a "warm-up" for the WRAT4.

words to assess the number of real words that he/she can accurately identify. The second subtest, Phonetic Decoding Efficiency, requires the individual to read aloud from a list of nonwords in order to assess how many nonwords can be correctly decoded.

Wide Range Achievement Test—Fourth Edition (WRAT4). The WRAT4 (Wilkinson & Robertson, 2006) is a norm-referenced, standardized test that assesses basic reading and math skills. It was developed for use with individuals between the ages of 5 years and 94 years, or in Grades K though 12. Two equivalent forms of the WRAT4 are available, the Green Form and the Blue Form. The latter was used in the current study as the primary measure of the participants' academic achievement. The WRAT4 is composed of four subtests: Word Reading; Sentence Comprehension; Spelling; and Math Computation. The recommended order of subtest administration, which was followed, is Word Reading, Sentence Comprehension, Spelling, and Math Computation, because this is the order in which the tests were administered during standardization (Wilkinson & Robertson, 2006). The average administration time is estimated to be between 15 and 25 minutes for children aged 5 to 7 years, and 30 and 45 minutes for individuals aged 8 years and older. Scoring of the WRAT4 provides an indication of how the individual compares to others of his/her age or grade. For each subtest, corresponding standard scores (M = 100, SD = 15) are computed from raw scores; a Reading Composite score is obtained by combining the Word Reading and Sentence Comprehension standard scores. The psychometric properties of the Blue Form are excellent; subtest internal consistency reliability coefficients are between .87 and .96, and adequate structural (i.e., the degree to which the items within the subtests are associated) and content validity (Wilkinson & Robertson, 2006).

Conners' ADHD/DSM-IV Parent Rating Scales (CADS-P) short form. The CADS-P served as one of the two standardized measures of children's mental health. The CADS-P short

form (Conners, 2001) is a brief, 26-item questionnaire that can be used to help identify and monitor the level of attention and hyperactivity of a young person between the ages of 3 and 17 years. The questionnaire is completed by the child or youth's primary caregiver and requires five to 10 minutes to complete. Items are rated on a four-point scale (0 = "Not True At All" to 4 = "Very Much True"). The CADS-P consists of a 12-item Attention Deficit Hyperactivity Disorder (ADHD) Index, and a 14-item Diagnostic and Statistical Manual-Fourth Edition (DSM-IV) Symptoms scale, which is composed of 7 questions relating to DSM-IV Inattentive symptoms and 7 to DSM-IV Hyperactive-Impulsive symptoms. Scoring of the CADS-P provides a DSM-IV Total T-Score (M = 50, SD = 10), based on 18 of the 26 items. An elevated T-score indicates a greater likelihood that the child would 'probably' meet the DSM-IV criteria for a diagnosis of ADHD. Internal consistency and test-retest reliability (over 6-8 weeks) are excellent, and discriminant validity has also been established (Conners, 2001). In the current study, only the ADHD Index T-score will be reported as it helps clinicians to distinguish children who have ADHD from those children who do not (Kelley, Noell, & Reitman, 2003). For the present sample, Cronbach's alpha was .94 for the ADHD Index subscale.

Achenbach System of Empirically Based Assessment's Child Behaviour Checklist for Ages 6-18 years (CBCL). The CBCL (Achenbach & Rescoria, 2001) served as the second standardized measure of the foster children's mental health. The CBCL is a 118-item questionnaire that takes 15 to 20 minutes to complete, and is used to assess children's internalizing and externalizing behaviour. Parents or guardians are asked to report on the young person's competencies (i.e., child's activities, social relations, and school performance), and behavioural and emotional problems. Completion of the questionnaire requires parents or guardians to consider the child within the past six months and to rate him or her on a 3-point

scale (0 = "not true" to 2 = "very true or often true") for each of the 113 items. In all, there are three competence scales, a Total Competence score, and eight Syndrome Scales.

Electronic scoring provides total raw scores and standard score equivalents for all subscales and Total Scores. Higher scores indicate a greater level of difficulty or distress. In addition to the syndrome scales, the scoring profile includes scores corresponding to two broad grouping of syndromes, Internalizing and Externalizing Syndromes, and a Total Problems score. Only the T-scores on the Internalizing and Externalizing subscales will be utilized in the current study for the mental health outcomes, while the Total Problems T-score will be used in the moderation analyses to help reduce the number of analyses completed. The scores for the Internalizing and Externalizing scales are obtained by summing the scores of the syndromes that comprise each scale. The reliability of the CBCL has been well-established, with adequate internal consistency for the syndrome scales (.72-.94), which have also been found to be stable over a 12- to 24-month period. Evidence is available that supports the content, criterion, and construct validity of the CBCL scales (Achenbach & Rescoria, 2001).

Self-Perception Profile for Children (SPPC). The Scholastic Competence scale from the SPPC (Harter, 1985) was used at the post-test to assess the participating children's academic self-perception; the reason for the one-time administration of this measure was due to difficulties locating a reliable and valid measure to assess children's perceived academic self-confidence prior to the launch of the current study. The SPPC was developed to assess the perceived competences across cognitive and physical skills of children aged 8 years and older. The 36-item questionnaire consists of five specific domains (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, and behavioural conduct), and an estimate of global self-worth. Each skill is assessed by six items along its own subscale. The responses

for each item are presented in a "structured alternative format" (Harter, 1985, p. 7), in which there are two opposite descriptions to choose from, in order to reduce socially desirable answers. To respond to each item, the children must first choose the description that, from their perspective, best resembles them and then must indicate whether the description is 'somewhat true' or 'really true' of themselves. Items are scored from 1 to 4, where a higher score reflects a more positive view of oneself. An example question is shown below:

Really true of me	Sort of true of me				Really true of me	Sort of true of me
□	□	Some children often forget what they have learned	**BUT**	Other children are able to remember things easily	□	□

The internal consistency of the SPPC has been found to be satisfactory, with alpha coefficients ranging from .79 to .84 (Harter, 1985). In the current sample, Cronbach's alpha for the Scholastic Competence scale at the post-test was .74. Evidence in support of the validity of the SPPS has been provided (Muris, Meesters, & Fijen, 2003), and the instrument has been used in numerous studies of children's social development (Shevlin, Adamson, & Collins, 2003).

Alabama Parenting Questionnaire (APQ). The APQ (Frick, 1991) was developed to address the lack of questionnaires that assessed both the positive and negative dimensions of parenting that have been associated with lower or higher levels of children's externalizing problems (Essau et al., 2006). The APQ assesses five parenting constructs (i.e., parental involvement, positive parenting, poor monitoring/supervision, inconsistent discipline, and corporal punishment) across parent and child respondents. The frequency of each parenting behaviour is rated on a 5-point Likert-type scale (1 = *Never* to 5 = *Always*). The APQ appears to have satisfactory validity and reliability (Dadds, Maujean, & Fraser, 2003; Shelton, Frick, & Wootton, 1996). Only the parental involvement and positive parenting subscales were utilized in

the present study in an effort to assess the foster parent and foster children's perceptions of their parent-child relationships. This questionnaire was also administered only at the post-test, also due to difficulties finding a reliable and valid measure of parent-child relationship prior to the launch of the study.

Research has demonstrated moderate-to-high internal consistency for the parental involvement scale and the positive parenting scale, based upon the responses of parents and their children in a clinical and community sample (Dadds et al., 2003; Essau et al., 2006; Shelton et al., 1996). In the present sample, Cronbach's alpha for the parental involvement scale, as rated by the foster children at the post-test, was .76, and .73 for the foster parents' ratings. Cronbach's alpha for the positive parenting scale, as rated by the foster children at the post-test, was .80, and .73 for the foster parents' ratings. According to Shelton et al. (1996), convergent validity was high across parent and child respondents on the parental involvement scale, but somewhat lower on the positive parenting subscale.

Foster parent questionnaire. These questionnaires were developed by the study research team and administered at the pre- and post-tests (Appendix D). The instrument allowed the foster parents in the experimental group to communicate the number of lessons they had conducted over the course of the first intervention year (2008-2009) and other fidelity-related information. They were also asked questions pertaining to their use of tutoring resources made available to them during the year and provided updates on the children's medication, Individualized Education Plans (IEPs), if a placement change was asked from the CAS, etc. The control group version of the questionnaire was similar to the version completed by the foster parents in the experimental group, except that questions related to the tutoring intervention were obviously omitted. The questions pertained to any tutoring or special help that the foster child

may have received during intervention year one, as well as any changes in medication, IEPs, etc. The responses from this version of the questionnaire were used to make sure that none of the wait-list control children had received the *TYCW* tutoring program during intervention year one.

Qualitative questions. Four open-ended questions were developed by the research team specifically for the purpose of the current study and were administered only at the post-test. The questions were written in a manner that it was expected to be easily understood by all participants, children and adults alike. The questions were designed to elicit the personal perceptions of the foster parents and foster children in the experimental group regarding the impact the tutoring had had on the foster parent-foster child relationship. More specifically, and as noted in Appendix E, the following two questions were posed to the foster parents in the experimental group: "In your opinion, did your tutoring of your foster child (or children) affect your relationship with the child (or children), either positively or negatively" and "In your opinion, did your tutoring of your foster child (or children) have any impact, positive or negative, on his/her emotional well-being or behaviour?". The following two questions were asked to the foster children in the experimental group: "Now that you've had the tutoring, do you find it easier to do reading and math homework than before? Or has there been really no change?" and "Did the tutoring make any difference in the way you get along with your foster parent who did the tutoring with you?". These four questions were not pretested. Rather, after the first administration of these open-ended questions at the post-test with the foster children and foster parents, there were no problems or confusion noted by the research team members. Thus, it was agreed that there was no need to revise the questions. Each experimental group participant's responses to both questions were written down by the assessor and tape recorded to ensure the accuracy of the responses. The participants in the wait-list control group were excluded from

this component of the assessment as they had not participated in the tutoring program during intervention year one.

Procedure

The current study was undertaken by a four-person research team from the Centre for Research on Educational and Community Services at the University of Ottawa. The project was carried out over three phases: Phase I (2007-2008) involved the design and launch of the project and the recruitment of participants; phase II (2008-2009) consisted of intervention year one and included the random assignment of the foster parents and foster children, the training of the foster parents as tutors in the experimental group, the implementation of the RESPs in both groups and the tutoring intervention in the experimental group, and the post-test assessment of the foster parents and foster children who remained (i.e., 30 of the 42 children in the experimental group and 34 of 35 in the wait-list control group); and phase III (2009-2010) consisted of intervention year two, in which both groups continued to receive RESPs, the wait-list control children received the *TYCW* tutoring intervention, and the experimental group received a second year of *TYCW* tutoring.

As previously mentioned, intervention year two was intended mainly to allow the wait-list control children to receive the tutoring intervention. As anticipated, attrition in the experimental group was high in intervention year two: at the follow-up assessment in June, 2010, only 16 of the original 42 experimental group children remained in the study, and only 19 of the original 35 control group children. For this reason, the present thesis will use the data from intervention year one only and will thus not include data from intervention year two.

Phase I: During this initial launch and recruitment phase, the research team recruited nine of the 53 Ontario CASs to collaborate and participate in the current study. Various means

were used to approach CASs, including a presentation of the project at a meeting at the Ontario Association of Children's Aid Societies of the directors of service from many of the CASs in the province. CASs that joined the study appointed a 'lead hand' who was responsible for acting as a liaison with the research team for the duration of the study. The lead hands also recruited prospective participants (i.e., foster children and their foster parents who met our inclusion criteria) and were to be available to assist in solving any difficulties that might arise. Each CAS signed a letter of agreement (see Appendix F) with the research team to confirm their participation in and agreement with the demands of the study. Once the agreement had been signed, the lead hand actively recruited participants.

Phase II: At the beginning of intervention year one (i.e., in September and October, 2008), three research team members traveled to each of the nine participating CASs. At each CAS, a research team member met with the foster children and their foster parents individually and used a recruitment text (see Appendix G) to explain the purpose of the study. The research team member was responsible for ensuring that both the foster children and their foster parents were clear about their respective responsibilities as participants in the study (e.g., receipt of the RESP, three hours of tutoring per week in the experimental group, and participation in pre- and post-intervention and follow-up assessments). The foster children and parents had the opportunity to ask questions and, if clearly hesitant, were encouraged not to join the study. If a particular foster parent did not have a computer in the home, the local CAS was responsible for providing one.

Once the participants' written assent and consent were obtained, the foster parent was asked to read aloud the Level 3 reading assessment passage (see Appendix C) from the *TYCW* program, to ensure that he/she had adequate reading skills to administer the tutoring program.

(All of the foster parents were able to read the passage successfully). The research team member then selected a randomization envelope from the top of the appropriate pile, corresponding to the type of family, or "stratum", described earlier. The envelope was opened in front of the foster child and foster parent, who were then immediately informed as to whether they had been randomly assigned to the experimental or the wait-list control group. Next, all the foster parents were given a handout that provided more information about RESPs (see Appendix H). Only the foster parents assigned to the experimental group received an additional handout that presented more detailed information about the *TYCW* tutoring program (see Appendix I) and were also informed of the time and date of the mandatory one-day training session that they had to attend before they could begin delivering the tutoring curriculum. Finally, each participating foster child, in both groups, received a bag containing RESP-labelled materials provided by CESP at HRSDC, including a piggy bank, a growth chart, a calculator, plastic rulers, and pens.

After giving a brief explanation about the CADS-P, CBCL and foster-parent questionnaire, the research team member asked the foster parent to complete the three questionnaires in the CAS waiting room while he/she administered the pre-intervention assessment instruments to the foster child in a CAS interview room. The tests were administered in the following order: the TOWRE; *TYCW* reading passages; and WRAT4 (Word Reading, Sentence Comprehension, Spelling, and Math Computation). The research team member was not blind to the intervention condition, as randomization had occurred just moments before.

Within a week of the preintervention assessments, the foster parents assigned to the experimental group were required to attend a one-day, 6-hour training session in their region, conducted by the author of the *TYCW* program. The purpose of this training was to familiarize the foster parents with the tutoring curriculum, teaching them how to implement the reading and

math components, providing corrective feedback, and teaching some basic information on behaviour-management strategies that could be implemented to help motivate the foster child to complete the tutoring lessons and to reduce disruptive behaviour. Once they had begun tutoring, the foster parents were required to collect performance data during each tutoring session (e.g., on the number of words read per minute by the foster child) and forward this data weekly, by email or telephone, to the project coordinator at the University of Ottawa. The project coordinator, in turn, forwarded the performance data to the author of the *TYCW* program, who monitored each child's progress. Foster parents were encouraged to contact the author of the *TYCW* program via email or a toll-free phone number for support and troubleshooting if they experienced difficulties in the implementation of the program or if a particular young person's performance data indicated that he or she was not making adequate progress. The author of the *TYCW* program also provided ongoing consultation, in the form of monthly teleseminars, one-on-one coaching through his toll-free tutor hotline, and project newsletters. The project coordinator was also in frequent contact with the foster parents to furnish a good deal of encouragement.

The post-test assessment that brought intervention year one to a close took place in June, 2009. The same three research team members met again with the foster parents and foster children who remained in the study (30 of the 42 children originally randomly assigned to the experimental group and 34 of the 35 originally assigned to the wait-list control group). The parents again completed the CADS-P, CBCL, and foster parent questionnaire. The foster parents were also asked to complete the parent version of the APQ. Likewise, the children were re-administered the TOWRE and the four WRAT4 subtests (from the Blue form), in the same order as at the pre-test. The research team member then orally administered the self-report version of the SPPC and the child version of the APQ and recorded the foster child's responses. The foster

children were provided their own copies of the questionnaires to follow along, as they were read aloud. Following the administration of the questionnaires, the research team member asked the experimental group foster children to answer the two open-ended qualitative questions designed specifically for the purposes of this study. Their responses were written and audio-recorded for accuracy. Once the assessment with the child was completed, the research team member then met with the foster parent in a separate room, away from the child, and orally administered the open-ended questions, for which the responses were also written and audio-recorded.

At the very end of the post-test assessment session, the foster parents who had been in the year-one wait-list control group were notified of the date and time they would receive the *TYCW* training. The foster parents in the experimental group were advised that they were not required to continue administering the tutoring over the summer months. They were asked, however, to begin tutoring again during the first week back to school in September, 2009.

Phase III: Intervention year two began in September, 2009. The foster parents in the experimental group were contacted by the research coordinator and reminded to start the tutoring as soon as possible. The parents in the control group attended a one-day, 6-hour training session in their region, conducted by the author of the *TYCW* program, in September 2009. The newly trained foster parents were asked to begin tutoring within a week of their training session. As in Phase II, the foster parents in both groups were asked to collect data on the young person's weekly performance and to forward the data by email or telephone to the project coordinator, who sent it to the author of the *TYCW* program for monitoring purposes. All of the same supports (i.e., teleseminars, newsletters, etc.) that had been provided to the parents in the experimental group during the previous year were now available to both groups of foster parents during year two.

The third and final wave of child and parent assessments took place in June, 2010. The same three research team members met with the participants who had remained in the study and had agreed to attend for the final assessment (i.e., only 16 experimental group and 19 control group children). The assessment process was very similar to that used during the first two waves; the foster parents were asked to complete the CADS-P, the CBCL, the parent-report version of the APQ, and the foster parent questionnaire, while the foster children were again administered the TOWRE and the four WRAT4 subtests, in order. Once these measures had been completed, the research team member orally administered the self-report version of the SPPC and the APQ to the foster child, while the child followed along by reading the questions as they were read aloud. The research team member recorded the child's responses.

Assessment of level of treatment fidelity and tutoring dosage. The level of fidelity of implementation of the tutoring reading component by the experimental-group foster parents was assessed collectively (rather than individually) by two members of the research team shortly after the post-test (i.e., during the summer of 2010). The joint assessment of fidelity was based on the weekly performance data that the foster parents had sent to the project coordinator, as well as on the information that the foster parents had provided in the post-test questionnaire. This information included the number of lessons covered during the year, the number of weeks of actual tutoring, and the average number of hours per week that had been dedicated to tutoring. The ratings of fidelity initially consisted of three categories, *higher* (n = 21), *medium* (n = 2), or *lower* (n = 7). Subsequently, the *medium* and *lower* categories were collapsed into a single *lower* category (n = 9) because of the small numbers of children in each.

A rating of a *higher* implementation fidelity was made (see Flynn et al., 2012) when the foster child was judged to have received approximately 25 weeks or more (i.e., approximately 60

lessons) of tutoring and had spent a substantial amount of time weekly on the different components of the tutoring process. A rating of a *lower* level of implementation fidelity was made when the foster child was judged to have received a relatively small amount of tutoring but still enough in terms of weeks (i.e., at least 5 weeks) and lessons (i.e., at least 10) to qualify as having received the intervention (versus not having received it at all). A similar procedure was used to assess implementation of tutoring in math. To verify the reliability of the ratings of reading tutoring fidelity, approximately one year after the initial ratings had been made, the files were reassessed by the two research team members who had made the original ratings and by a third team member. None of the team members had knowledge of nor could they recall the child's initial rating. A similar re-rating of math tutoring fidelity was not attempted, as the team members found that math tutoring was considerably more fluid and difficult to rate (see page 132 for more information).

Analysis of qualitative responses. Content analyses were conducted on the foster children's and parents' responses to the open-ended questions posed to them at post-test, with a view to subjectively and systematically classify and code their responses into thematic categories (Hsieh & Shannon, 2003). More specifically, the purpose of the analyses were threefold: to identify whether, in their response to each question, the foster children indicated a perceived "positive", "negative", or "no" change with regard to his/her ability to do reading and math homework since having completed the tutoring, and in how they got along with the foster parent who did the tutoring with them; to identify whether, in response to each question, the foster parents indicated a perceived "positive", "negative", or "no" change with regard to their relationship with their foster children, and in their foster children's emotional well-being and

behaviour; and to identify additional themes within the foster children and parents' responses regarding their perceived impact of the tutoring and their experience with the tutoring program.

Following the post-test assessments, the audio-recordings of the experimental group's responses to the qualitative questions were transcribed by one of the research team member to facilitate the content analysis. The content analysis of the transcripts was guided by a two complementary approaches; summative and conventional. A summative approach was used to guide the analysis of the transcripts in order to identify and quantify (Hsieh & Shannon, 2005) the three key words (i.e., "positive", "negative" or "no") to help determine experimental group foster parents' and children's perceived level of change in the foster children's academic ability, mental health, and parent-child relationship after having delivered/received the tutoring intervention, respectively. A conventional approach was also used in an attempt to understand the experimental group's experience with the *TYCW* tutoring program, as it is "generally used with a study design whose aim is to describe a phenomenon […] when existing theory or research literature is limited (Hsieh & Shannon, 2005, p. 1279). One of the advantages of conventional content analysis is that it does not impose preconceived categories or theoretical perspectives on participants' responses and it allows the researcher to gain information directly from the study participants (Hsieh & Shannon, 2005).

The content analysis was completed in five steps, which were outlined by Hsieh and Shannon (2005). First, the transcripts were read over once to obtain a sense of the foster children and foster parents' responses; second, the transcripts were re-read, word for word, to identify categories of responses and themes within the responses provided and key words (single words or phrases) were highlighted; third, the highlighted key words were reviewed and, if they indicated a perceived level of change, the responses were subsequently recorded in the

appropriate category indicated in the content-analysis grid that was developed by this writer for the purpose of this analysis; fourth, quotations that fit into theme categories were identified and were also put into the analysis grid; and the fifth, and final, step included establishing inter-rater reliability for the ratings of perceived level of change, which was established between the two research team members who conducted the analyses. Any differences were reconciled through discussion, and agreement was achieved.

Data Analyses

Hypothesis testing. The study by Flynn et al. (2012) had used ANCOVA via multiple regression for their analyses. The current study used repeated-measures ANOVA (RMANOVA) with one within-factor (i.e., time/assessment occasion) and two between-factors (i.e., group/experimental condition and gender) because it is equivalent to gain-score analyses and answers the question, "How do the children in the experimental (tutoring) and wait-list control groups differ, on average, in terms of their gains?" rather than "Given that experimental and control-group participants started at pre-test with the same score, how do they differ at post-test?" which is the question that ANCOVA analyses answers (Smolkowski, 2010). Thus, these two statistical approaches should give similar although not identical findings (Smolkowski, 2010), as they answer related but somewhat different questions. The advantages of RMANOVA are that it can be used in an array of research designs, including studies with two assessments per individual (i.e., a pre-test/post-test) to compare the pre-test and post-test differences between two independent groups, it is not vulnerable to the usual covariate under-adjustment found with ANCOVA, due to covariate unreliability, and it produces an *F*-statistic with only one numerator degree of freedom while testing the group effect (i.e., it is not adjusting for anything), versus

ANCOVA in which there are two degrees of freedom in order to adjust also for the covariate (time 1) assessment (Smolkowski, 2010).

Statistical analyses using RMANOVA were used to check (or re-verify) the primary hypothesis (i.e., that the tutoring intervention would lead to greater gains in reading and math than the wait-list control condition). RMANOVA was also used to address the working hypothesis regarding the moderating effects of gender (i.e., Working Hypotheses 1), the auxiliary role of mental health on the educational outcomes on the WRAT4 subtests (i.e., Working Hypothesis 2 and 3), the effects of tutoring one foster child versus two foster children (Exploratory Research Question 1), the moderating effects of implementation fidelity (i.e., Exploratory Research Question 2), the moderating effects of foster children's hyperactivity/inattention (Exploratory Research Question 3), and overall mental health (Exploratory Research Question 4). Amongst these analyses, paired *t*-tests were conducted to compare the pre-test and post-test means of the girls and boys in the experimental and control groups on the educational (i.e., WRAT4) and mental health (i.e., Conners' and CBCL) outcome measures. Even in the absence of a statistically significant three-way interaction (time x group x gender), paired *t*-test analyses were conducted due to the exploratory nature of the current study, limited power (because of small sample sizes), and a particular interest in documenting the hitherto unstudied possible role of gender in tutoring research.

Analysis of Variance (ANOVA) was used to analyze Working Hypotheses 4, 5 and 6, where the outcome measure had been administered at the post-test only (i.e., SPPC and APQ). Independent-samples *t*-tests were conducted to compare the mean scores of the girls and boys, within the experimental and wait-list control groups, respectively, to determine if there were any

significant differences. These analyses were conducted even in the absence of a statistically significant two-way interaction (time x group).

Regression analyses were used to address Exploratory Research Question 5, exploring whether the foster children's gains in reading or math skills would have a direct effect on his/her mental health outcomes (i.e., whether the foster children's gains in reading or math skills during intervention year one predicted their level of mental health symptoms at the post-test, while controlling for the level of their mental health symptoms at the pre-test). Regression was also used to explore effects due to a possible dose-response among the experimental group children (i.e., whether the sheer number of tutoring lessons covered weekly or the child's cooperation during the tutoring could help to explain the variance in the results—Exploratory Research Questions 6 and 7, respectively). Finally, as described above, a content analysis was used to address the qualitative responses of the foster children and foster parents associated with Exploratory Research Questions 8, 9, 10 and 11, respectively.

Regarding the specific measures previously described in the Method section, the analyses for the primary working hypothesis, regarding the moderating effects of gender, were conducted on the five subscales of the WRAT4, as were the analyses for exploratory research question 1. The analyses for working hypothesis 2 were conducted on the ADHD Index T-Score of the CADS-P, while those for working hypothesis 3 were carried out on the Internalizing and Externalizing scales of the CBCL. The analyses for working hypothesis 4 were carried out on the Scholastic Competence subscale of the SPPC. Analyses for working hypothesis 5 utilized the foster-child versions of the APQ positive parenting and parental involvement subscales, while those for working hypothesis 6 were conducted on the foster-parent version of the same APQ subscales.

With regard to Exploratory Research Question 2, the analyses were conducted on the 'higher' and 'lower' implementation fidelity ratings established by the research team shortly after the post-test assessment, as described earlier. The analyses for the moderating effects of children's mental health (i.e., Exploratory Research Questions 3 and 4) were conducted on the ADHD Index T-score of the CADS-P and the Total Problems T-score of the CBCL, respectively. Analyses for Exploratory Research Question 5 were conducted on the experimental group's WRAT4 gain scores, while the analyses for Exploratory Research Questions 6 and 7 were conducted on the responses obtained from two questions on the foster parent questionnaire completed by those foster parents in the experimental group at the post-test that relate to the sheer number of lessons the foster child received throughout the intervention year *and* the foster parent's perception of how cooperative their foster child was during the administration of the tutoring. Analyses for Exploratory Research Questions 8, 9, 10 and 11 were carried out by content analysis of the qualitative questions posed to the experimental group foster children and foster parents during the post-test assessment.

Regarding the level of statistical significance employed, the larger number of analyses carried out could be used as an argument for adopting a relatively stringent alpha level (e.g., $p < .01$). However, given that most of the analyses conducted herein (i.e., those involving gender) were exploratory in nature, the $p < .05$ level of significance was retained. For the same reasons, more attention was also paid to the size of effects, relative to the median effect size of 0.29 found by Lipsey et al. (2012, Table 10, p. 36) for one-to-one educational interventions such as individual tutoring (see the discussion of this point immediately below).

Effect size index. Cohen's *d* (which is virtually identical to Hedge's *g*) was used as the effect size, to determine the measure of magnitude of the treatment effect of the tutoring

intervention between the experimental and control group children. Cohen (1988) proposed that an effect size of 0.2 would reflect a 'small' effect, 0.5 a 'medium' effect, and 0.8 a 'large' effect. Given the current study's interest in the between-subjects differences in the effects of the tutoring on the boys versus the girls in the experimental and control groups, only the between-group Cohen's *d* was calculated, using an online effect size calculator from the Campbell Collaboration (Wilson, n.d.).

According to the What Works Clearinghouse (WWC) *Procedures and Standards Handbook* (version 2.0) (WWC; 2008), an effect size equal to or greater than 0.25 should be deemed as being 'substantively important', even though the effect size may not have reached statistical significance, because it reflects a minimum of a 10-percentile point difference between the means of the control and intervention groups on a normal distribution. Therefore, the current study applied the recommended criterion to denote any effects that could be considered substantively important. Although this criterion by the WWC will be used to help interpret the finding herein, caution needs to be drawn to its use as a 'hard and fast' rule in the light of a new document published in November 2012 by Lipsey et al. (2012) in which it is suggested that "in intervention areas that involve hard to change low baserate outcomes, […], the most impressively large effect sizes found to date fall well below the .20 that Cohen characterized as small" (p. 4). According to Lipsey and colleagues, education and educational research are included within those areas in which variables are considered "hard to move" and, thus, the magnitude of effect sizes, when compared to those within other 'easier to move' domains, may lead to inappropriate and misleading interpretations of results. In fact, Lipsey et al. (2012, Table 10, p. 36) compiled a total of 829 effect sizes from randomized studies of educational interventions and found that the overall median effect size was only 0.18 (i.e., close to Cohen's

(1988) "small" effect size of 0.20). For the 252 effect sizes taken from studies of educational interventions, including one-to-one tutoring, the median effect size was 0.29. This is only slightly larger than the WWC benchmark of 0.25 and supports the contention of Lipsey et al. that the traditional criterion put forth by Cohen (1988) of 0.20 (small), 0.50 (medium), and 0.80 (large) are inappropriate when applied to the field of education. Therefore, this thesis will adopt the median effect size of 0.29 from Lipsey at al., which is equivalent to a "medium" effect size, as a guide to determine the size of effects elicited from the tutoring intervention. Due to the exploratory nature of the analyses and results, and low power particularly stemming from the gender-related analyses, the soon-to-be presented findings will present both the statistical significance and the size of the effect.

In the cases of the multivariate analyses, the index of effect size was Eta-squared (Eta^2), which indicates the ratio of variance explained in the dependent variable by the independent variable, while controlling for other predictors (Wilkinson, 1999; Pierce, Block, & Aguinis, 2004). The Eta^2-values reported herein (in the tables of results, found in the appendices) were hand-calculated using the formula presented by Pierce et al. (2004, p. 918).

RESULTS

Preliminary Results

Pre-Test Equivalence of Groups, Before and After Attrition

Of relevance to the internal validity of the current study, there were no statistically significant differences (i.e., $p > .050$) at the pre-test between the foster children who had been randomly assigned to the experimental and control groups on the key demographic variables (i.e., gender and age), the WRAT4 subscale mean standard scores, the CADS-P ADHD Index or the three CBCL subscale mean T-scores. Thus, randomization can be said to have "worked".

Between the pre-test (September-October, 2008) and the post-test (June, 2009), 12 of the 42 foster children (28.6%) in the experimental group and one of the 35 (2.9%) foster children in the wait-list control group withdrew from the study. The reasons for this attrition are given in the following section. However, the attrition of these participants did not appear to have compromised the pre-test equivalence of the two groups (and thus did not seem to impair in a major way the internal validity of the study) because the difference in the pre-test means of the remaining 30 experimental group participants (17 girls, 13 boys) and the 34 remaining wait-list control group (19 girls, 15 boys) remained nonsignificant ($p > .050$) on gender and age, as well as the academic (i.e., WRAT4) and mental health subscale standardized mean scores (see Figures 2 and 3).

Even though the present study was concerned only with the pre-test and the post-test (i.e., year 1 of the research), it is noted for the record that by the end of the second year (i.e., June, 2010), 46% of the original participants remained and were assessed. That is, between the post-test (June, 2009) and the follow-up (June, 2010), 14 of the 30 foster children (46.6%) in the experimental group and 15 of the 34 (44.1%) in the wait-list control group withdrew from the study. Although the attrition in the second year was quite substantial, it did not appear to compromise the pre-test equivalence of the two groups. However, the main purpose of the second year was to ensure that the wait-list control children received the tutoring intervention.

Representativeness of the original and analysis (i.e., pre- and post-attrition) samples. This subsection relates to the external validity of the study sample. To determine representativeness, the basic demographic information of the 77 foster children recruited for participation in the current study were compared to the 64 foster children who remained in the study (post-attrition) and the 1131 children and youth aged 6 to 13 years and living in out-of-

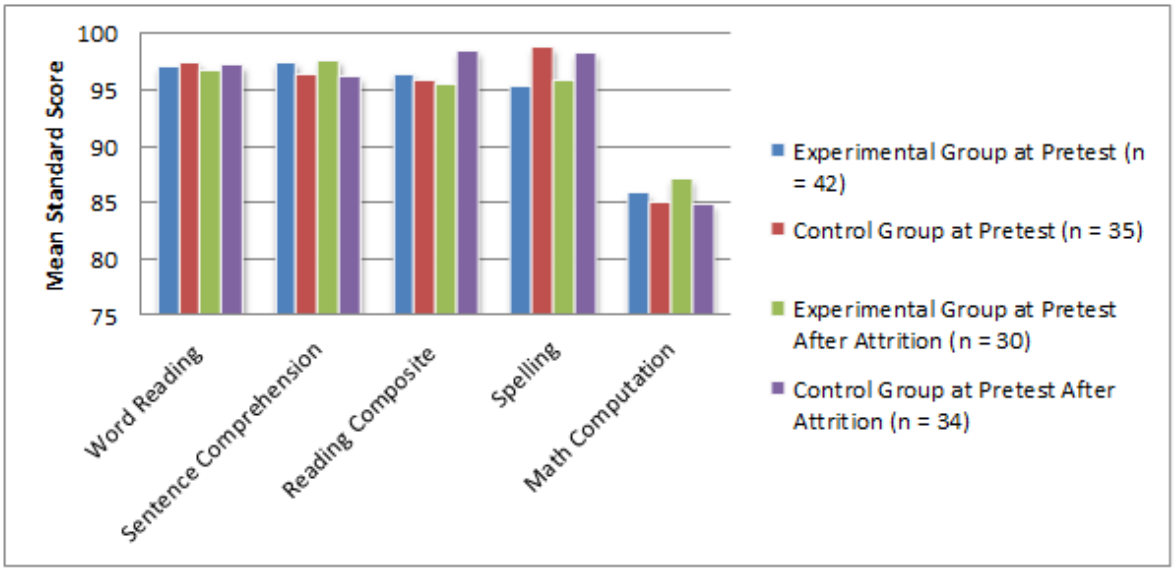

Figure 2. Pre-test Equivalency of Experimental and Control Groups Before and After Attrition, on WRAT4 Subscales.

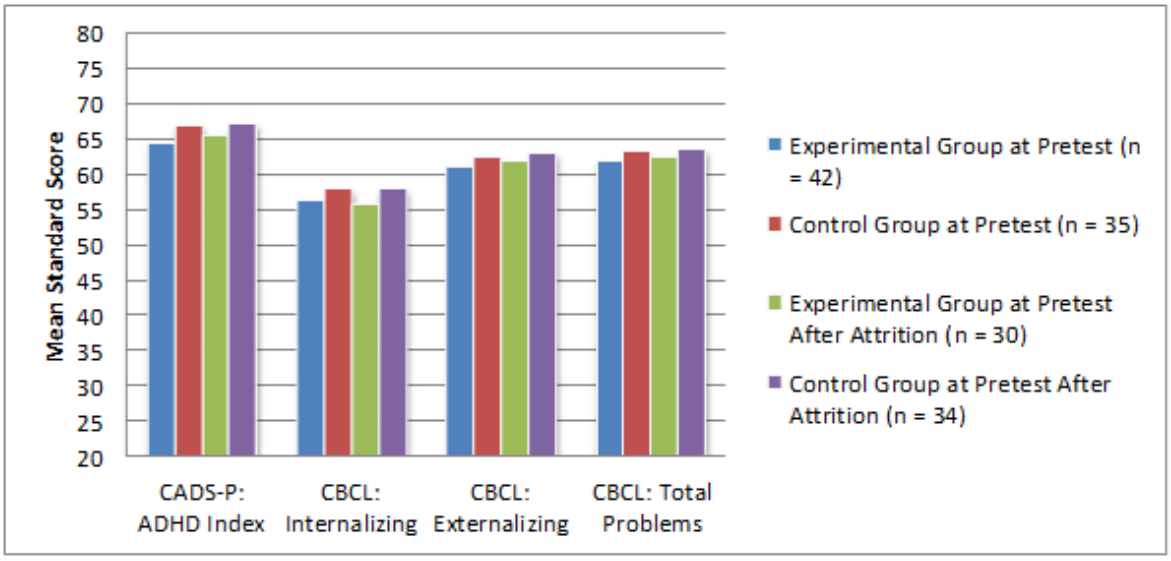

Figure 3. Pre-test Equivalency of Experimental and Control Groups Before and After Attrition on Mental Health Subscales.

home care in Ontario, Canada between 2008-2009 (obtained from the Year 8 data collected as part of the long-term Ontario Looking After Children project; Flynn, Vincent, & Miller, 2011). According to the results, it appears as though the pre- and post-attrition groups of foster children of the current study were a relatively representative subset of children living in foster- or kinship care placements in Ontario in 2008-2009 in terms of age, gender, and grade (see Table 1).

The recruited and participating foster children also appeared to be relatively representative of other foster children in Ontario with regard to level of mental health difficulties: the mean score for the two former groups of foster children fell in the clinically significant range on the Total Problems scale of the CBCL (*T*-score $\geq$ 63; Achenbach & Rescoria, 2001; for the current sample), while the mean score for the latter group was also in the clinical range (i.e., scores between 18-40) on the Total Difficulties scale of the comparable Strengths and Difficulties Questionnaire (see Marquis & Flynn, 2009, for a brief overview; Goodman, 1997, 2001). In terms of academic performance, the baseline WRAT4 mean scores of the pre-attrition (N = 77) and post-attrition (N = 64) foster children were similar to the standardized pre-test scores of foster children in the United states, as summarized by Trout et al. (2008), with all three groups of foster children demonstrating a greater weakness on math computation than in reading.

Reasons for attrition. Based on information obtained directly from the foster parents (see RESP final report, Flynn, Marquis, Paquet, Peeke, and Aubry, 2011), the reasons for attrition could be categorized as either *endogenous* (i.e., relating directly to either the intervention or control conditions, such as, the tutoring took too much time or it was a source of conflict between the tutor and child), *exogenous* (i.e., circumstances unrelated to either condition, such as, a foster parent or child falling ill or a chance in the child's placement), or

Table 1.

RESP original (pre-attrition) and analysis (post-attrition) samples, compared with the Year 8 (2008-2009) OnLAC sample that was aged 6-13 years, residing in foster care, and in grades 2-7 in the 2008-2009 school year.

	RESP Original (N = 77)			RESP Analysis (N = 64)			OnLAC Y8 (N = 1131)		
Variable	*M*	*SD*	%	*M*	*SD*	%	*M*	*SD*	%
Gender									
Male			46.8			43.8			53.3
Female			53.2			56.3			46.7
Age of child	10.72	1.58		10.70	1.59		10.05	1.85	
Grade of child	5.25	1.49		5.19	1.47		4.77	1.72	

mixed (i.e., a combination of both endogenous and exogenous factors). During the first year of the study (i.e., before the post-test in June, 2009), 5 of the 12 cases of attrition in the experimental group were mainly endogenous, 5 were mainly exogenous, and 2 were mixed. The single case of attrition in the wait-list control group was exogenous in nature, caused by a change in the foster child's placement.

Effect of treatment as delivered rather than as assigned. Given the attrition just discussed, the current study adopted the aim of conducting an analysis of the effects of the *TYCW* tutoring method, relative to the wait-list control condition, based on those children *who had received it* (i.e., an "as delivered" or "non-intent-to-treat" (nonITT) analysis) rather than an analysis of all the children *who had been assigned* to the TYCW tutoring (i.e., an "as assigned" or an "intent-to-treat" (ITT) analysis). The main reason was that we considered our research to be primarily developmental in nature. That is, this project marked the first time, at least in the English, Swedish, Danish, or Norwegian-language research literatures, that a randomized study of TYCW tutoring—or, indeed, of *any* educational intervention, whether tutoring or not—had been conducted with children in care of primary school age (Forsman & Vinnerljung, 2012). According to Ten Have, Normand, Marcus, Brown, Lavori, and Duan (2008), when a new treatment is being developed, an as-received (i.e., nonITT) analysis is usually considered more pertinent than an as-assigned (i.e., ITT) analysis. After several randomized nonITT evaluations of TYCW have been carried out (assuming attrition), a public-health-oriented ITT analysis will become more feasible (Ten Have et al., 2008).

Educational Results

In presenting the educational results, each WRAT4 subtest will be covered as follows. First, the group-by-time interaction results from the current study's only formal hypothesis (from

a repeated-measures ANOVA, rather than an ANCOVA, perspective), that *the tutoring intervention will lead to greater gains in reading and math skills than the wait-list control condition* will be presented. As noted, these results are expected to be similar, but not identical, to those found in the first study of the same project by Flynn et al. (2012), given the use of different statistical approaches. The full results for the repeated-measures ANOVA (RMANOVA) will be presented in Appendix J along with the corresponding tables for each of the WRAT4 subtests. Second, the results of the analyses in which gender was used as a moderator variable will be presented via the results of the paired *t*-tests and accompanying effect sizes (i.e., Cohen's *d*) for the pre-test to post-test gains made by the girls and boys in the experimental and control groups. The corresponding table of means and standard deviations for the experimental and control groups will be presented, along with figures to help with the ease of the interpretation of the results. Given the young ages of the participants, the results will be presented denoting them as girls and boys, rather than females and males.

Hypothesis 1: Effects of the *TYCW* Tutoring Intervention on WRAT4 Outcomes in the Sample as a Whole

As previously mentioned, the tables corresponding to these following results will be presented in Appendix J. On WRAT4 Word Reading (Table A1), which assessed the decoding of letters and words through identification and word recognition (Wilkinson & Robertson, 2006), the difference between the post-test group means was statistically significant (in favour of the tutoring group) only at the level of a trend[5]. On Sentence Comprehension (Table A2), which assessed the children's ability to gain meaning from words and comprehend ideas and information contained in sentences, the differences between the post-test group means was

[5] N.B., the *p*-values within this section only are one-tailed because there was an apriori hypothesis regarding these findings; according to Ley (1979), a directional *F*-test of $p = .10$ is equivalent to a one-tailed of .05 for *t*-tests.

statistically significant, in the hypothesized direction (i.e., in favour of the tutoring group). On Reading Composite (Table A3), a score that was obtained by combining the standard scores for Word Reading and Sentence Comprehension, the difference between the post-test group means was statistically significant, in favour of the tutoring group. On Spelling (Table A4), which assessed the foster children's ability to encode sounds into written form through the use of a dictated spelling format that contains both letters and words, the difference between the post-test group means was statistically significant, in favour of the tutoring group. Finally, on Math Computation (Table A5), a subtest that measured the children's ability to perform basic mathematical computations through counting, identifying numbers, solving simple oral problems, and calculating written math problems, the difference between the post-test means was statistically significant, in favour of the tutoring group.

In order to determine if there was a differential effect in the pre- and post-test scores between the children in the control and experimental groups, Cohen's *d* effect sizes were calculated for each of the WRAT4 subscales, the results of which are presented in Table 2. The between-groups (i.e., tutoring versus control) effect sizes demonstrated that the foster children in the experimental group, who received the *TYCW* tutoring, had an advantage over the children in the control group on Math Computation—the effect that was well-above the 0.25 threshold set by the WWC (2008) to be considered substantively important and relatively large, according to Lipsey et al. (2012) (d = 0.43, 95% CIs [0.08, 0.78]). On the remaining four WRAT4 subtests, the effect sizes suggest that the tutoring program gave the children in the experimental group a slight advantage over the children in the control group, who did not receive any intervention throughout the 2008-2009 academic year.

Table 2.

Effect-size advantage (Cohen's d) on WRAT4 subscales of tutoring versus control children, as a sample as a whole.

WRAT4 Subscale	*n*	*d*	95% CIs
Word Reading	64	0.21	[-0.0, 0.5]
Sentence Comprehension	64	0.24	[-0.0, 0.5]
Reading Composite	64	0.22	[-0.0, 0.4]
Spelling	64	0.16	[-0.0, 0.4]
Math Computation	64	0.43	[0.1, 0.8]

Working Hypothesis 1: Differential Gender Effects of the Academic Tutoring.

Word Reading. Table 3 presents the paired *t*-test results, Cohen's *d* effect sizes and 95% confidence intervals for the experimental and wait-list control groups on this WRAT4 subtest. Figures 4 and 5 presents these results visually, by gender, to aid in the interpretation. Only the girls in the experimental group experienced a statistically significant average gain. Although the average gain was at the level of a trend for the control group boys, neither the boys in the experimental group nor the girls in the control group demonstrated statistically significant pre- to post-test gains in their mean scores.

Regarding the mean level of change, the between-group (i.e., tutoring versus control) effect sizes indicated that the tutoring intervention gave the girls in the experimental group an advantage over the boys in the experimental group as well as those children in the control group, as demonstrated by the relatively large (Lipsey et al., 2012) and substantively important effect size. This is in contrast to the between-group (i.e., tutoring versus control) effect size for the boys, which was virtually zero.

Sentence Comprehension. Table 4 presents the results of the paired *t*-test, along with Cohen's *d* effect sizes and 95% confidence intervals for the experimental and control groups. Figures 6 and 7 present these results visually by gender. On this subscale, both the girls and the boys in the experimental group, as well as the girls in the control group demonstrated statistically significant gains over the course of the intervention year. There was no significant change in the pre-to-post-test means of the control boys.

The between-group (i.e., tutoring versus control) effect sizes indicated that the tutoring program gave the boys in the experimental group an advantage over the girls in the experimental group and the boys and girls in the control group, on Sentence Comprehension. That is, the

Table 3.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for WRAT4 Word Reading, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	94.47	98.13	17.42	14.38	1.77	.100		
Experimental Group	13	101.69	105.54	11.53	17.02	1.61	.132		
Total	28	97.82	101.57	15.16	15.82			0.01	[-0.4, 0.4]
Girls:									
Control Group	19	99.37	97.53	17.18	11.98	-0.82	.424		
Experimental Group	17	93.06	96.35	12.36	10.16	2.30	**.035**		
Total	36	96.80	96.97	15.22	13.41			0.39	[0.0, 0.8]
Boys and Girls:									
Control Group	34	97.21	97.79	17.20	12.89				
Experimental Group	30	96.80	100.33	12.58	14.08				
Total	64	97.02	98.98	15.10	13.41				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

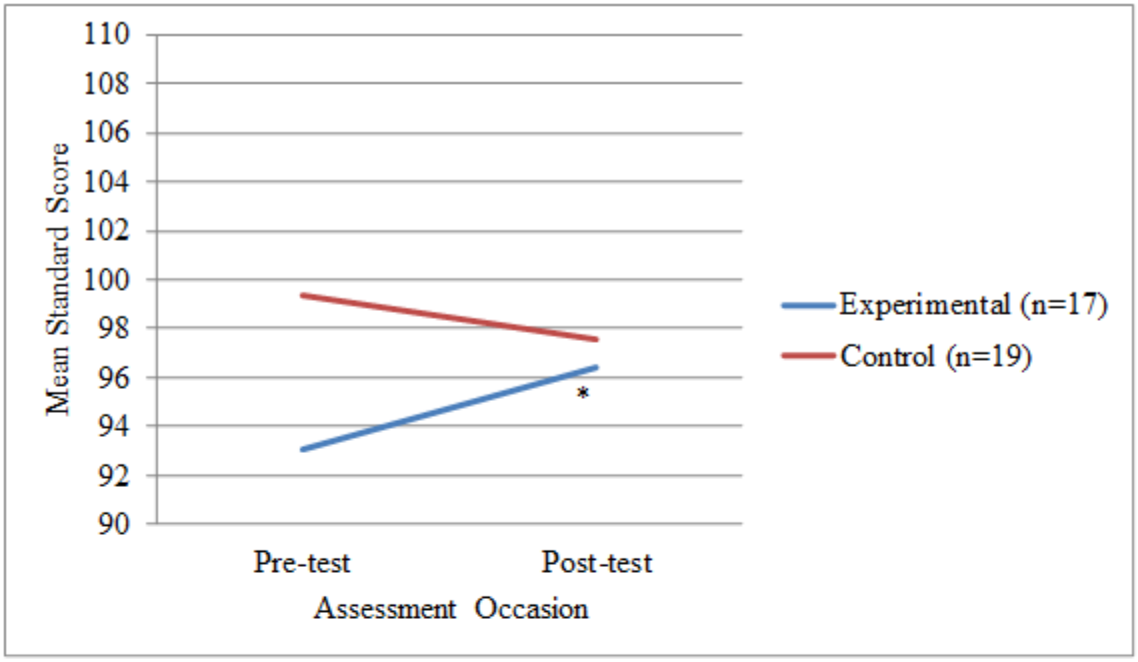

Figure 4. Experimental and Control Groups' Girls' WRAT4 Word Reading Mean Standard Scores at Pre-test and Post-test ($d = 0.39$). *$p = .035$, two-tailed.

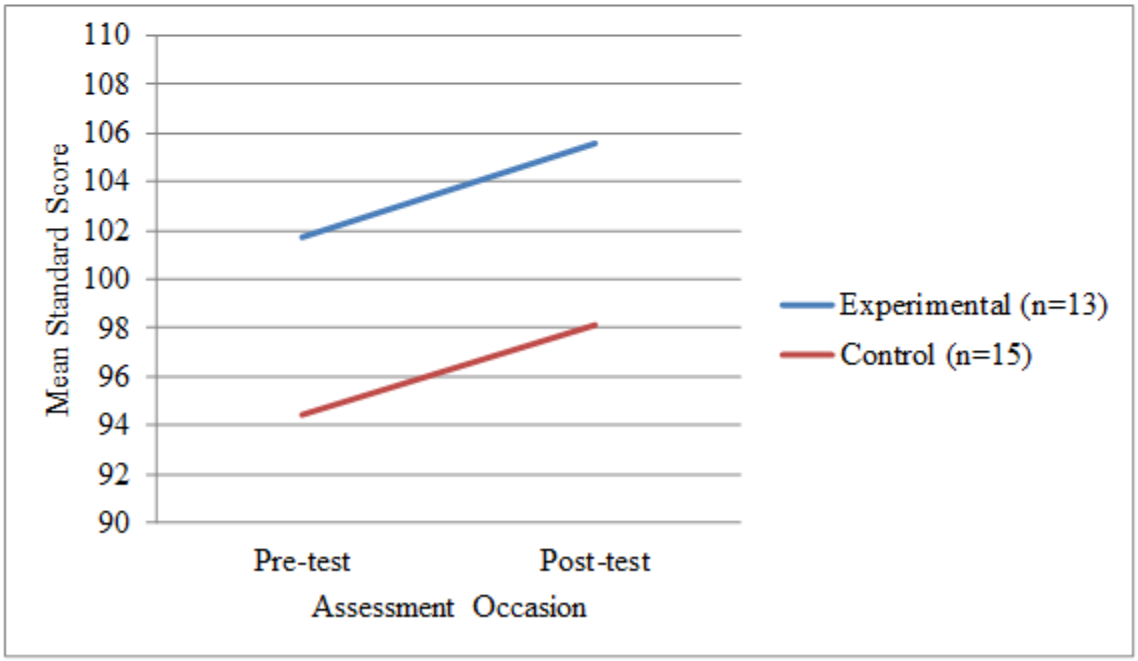

Figure 5. Experimental and Control Groups' Boys' WRAT4 Word Reading Mean Standard Scores at Pre-test and Post-test ($d = 0.01$).

Table 4.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for WRAT4 Sentence Comprehension, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	95.93	96.40	10.96	10.34	0.29	.778		
Experimental Group	13	102.77	108.08	13.76	9.00	2.45	**.030**		
Total	28	99.11	101.82	12.59	11.25			0.44	[-0.0, 0.9]
Girls:									
Control Group	19	96.42	100.58	15.28	12.08	2.71	**.014**		
Experimental Group	17	93.77	99.59	14.01	12.83	2.65	**.017**		
Total	36	95.17	100.11	14.55	12.27			0.12	[-0.3, 0.5]
Boys and Girls:									
Control Group	34	96.21	98.74	13.36	11.37				
Experimental Group	30	97.67	103.27	14.39	11.94				
Total	64	96.89	100.86	13.76	11.77				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

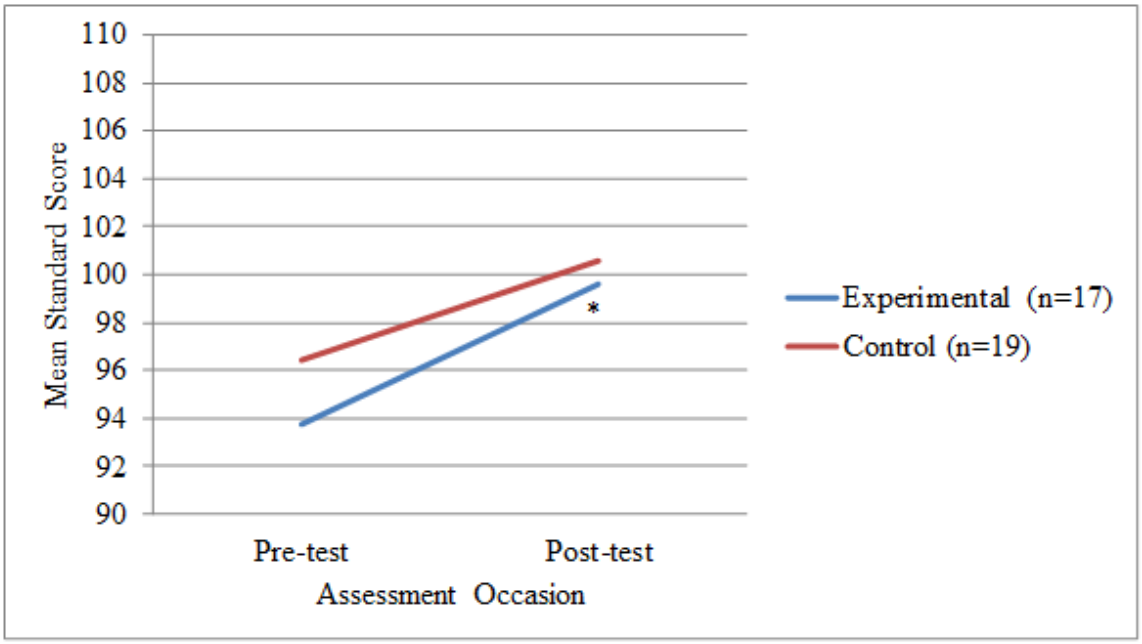

Figure 6. Experimental and Control Groups' Girls' WRAT4 Sentence Comprehension Mean Standard Scores at Pre-test and Post-test ($d = 0.12$). *$p = .017$, two-tailed; **$p = .014$, two-tailed.

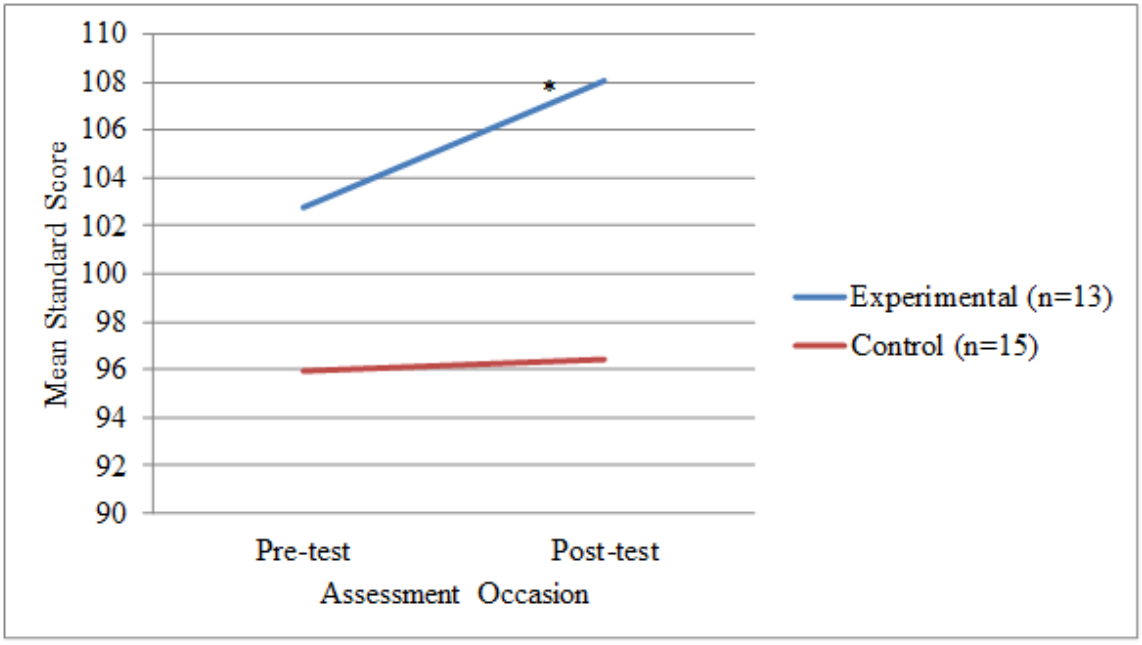

Figure 7. Experimental and Control Groups' Boys' WRAT4 Sentence Comprehension Mean Standard Scores at Pre-test and Post-test ($d = 0.44$). *$p = .030$, two-tailed.

effect size for the boys on the Sentence Comprehension subscale was relatively large (Lipsey et al., 2012) and substantively important (WWC, 2008), as compared to the relatively small (Lipsey et al.) effect for the girls, which fell well-below the threshold to be considered substantively important (WWC).

Reading Composite. Table 5 presents the paired *t*-test results, Cohen's *d* effect sizes and 95% confidence intervals for the experimental and control groups on this measure, which, again, is derived by combining the Word Reading and Sentence Comprehension standard scores. Figures 8 and 9 present these results visually by gender. Both the experimental group girls and boys made statistically significant average gains. Neither the girls nor the boys in the control group demonstrated significant change in their pre- to post-test mean scores. The between-group (i.e., tutoring versus control) effect sizes indicated that, although both the boys and the girls in the experimental group made notable gains, there was no evidence of a differential effect on their Reading Composite mean scores.

Spelling. Table 6 presents the results of the paired *t*-test, along with Cohen's *d* effect sizes and 95% confidence intervals for the experimental and control groups. Figures 10 and 11 present these results visually by gender. Only at the level of a trend did the experimental group girls and boys demonstrate any gains on this subtest. There was no statistically significant change in the pre-test to post-test means of the control girls or boys. The between-group (i.e., tutoring versus control) effect sizes revealed that there was no differential effect of the tutoring for either the boys or the girls in the experimental group on their Spelling pre-post-test mean scores.

Table 5.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for WRAT4 Reading Composite, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	94.13	96.40	14.64	12.72	1.46	.166		
Experimental Group	13	101.77	106.69	13.07	14.01	2.99	**.011**		
Total	28	97.68	101.18	14.21	14.09			0.19	[-0.1, 0.5]
Girls:									
Control Group	19	96.84	98.26	16.60	12.71	0.84	.414		
Experimental Group	17	92.24	97.06	14.79	11.18	2.83	**.012**		
Total	36	94.67	97.69	14.79	11.86			0.25	[-0.1, 0.6]
Boys and Girls:									
Control Group	34	95.65	97.44	15.59	12.55				
Experimental Group	30	96.37	101.23	13.42	13.18				
Total	64	95.98	99.22	14.50	12.90				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

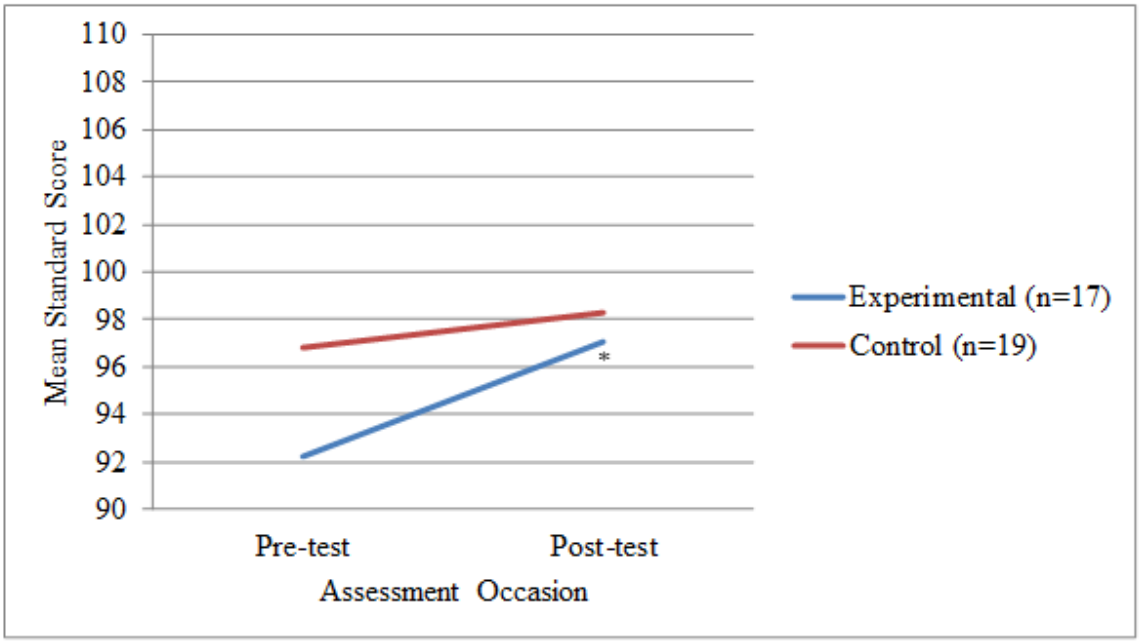

Figure 8. Experimental and Control Groups' Girls' WRAT4 Reading Composite Mean Standard Scores at Pre-test and Post-test ($d = 0.25$). *$p = .012$, two-tailed.

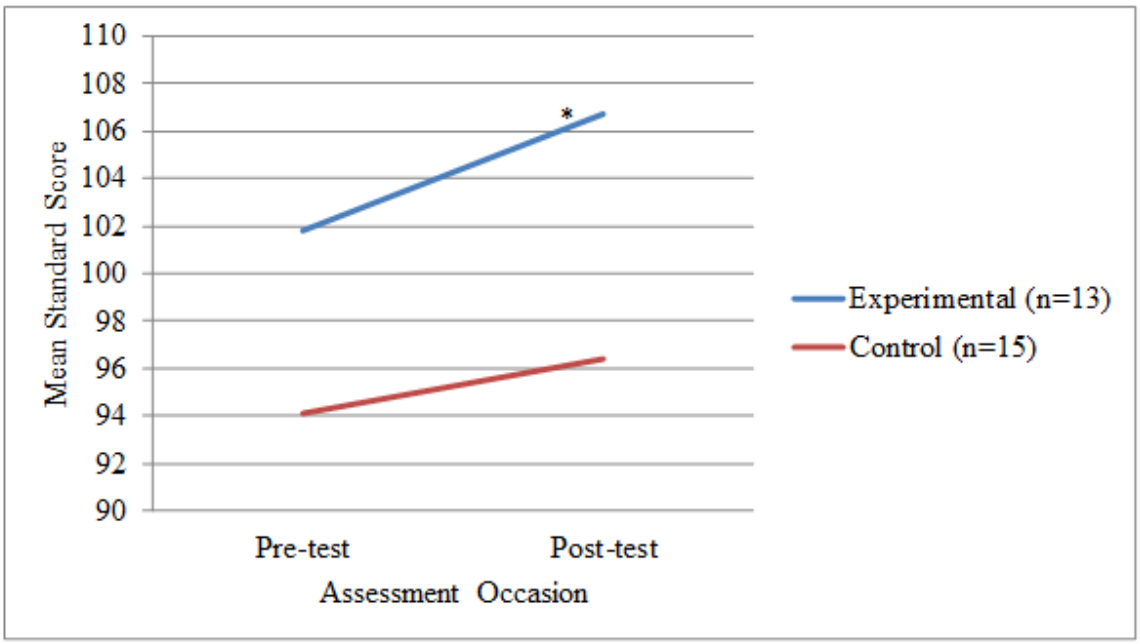

Figure 9. Experimental and Control Groups' Boys' WRAT4 Reading Composite Mean Standard Scores at Pre-test and Post-test ($d = 0.19$). *$p = .011$, two-tailed.

Table 6.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for WRAT4 Spelling, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	97.27	97.87	17.39	18.60	0.35	.731		
Experimental Group	13	98.77	102.62	17.39	16.11	1.84	.090		
Total	28	97.96	100.07	17.08	17.33			0.19	[-0.1, 0.5]
Girls:									
Control Group	19	99.53	99.68	12.26	12.07	0.16	.877		
Experimental Group	17	93.06	95.12	12.60	13.09	1.83	.086		
Total	36	96.47	97.53	12.68	12.59			0.15	[-0.1, 0.4]
Boys and Girls:									
Control Group	34	98.53	98.88	14.55	15.07				
Experimental Group	30	95.53	98.37	14.87	14.70				
Total	64	97.13	98.64	14.66	14.78				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

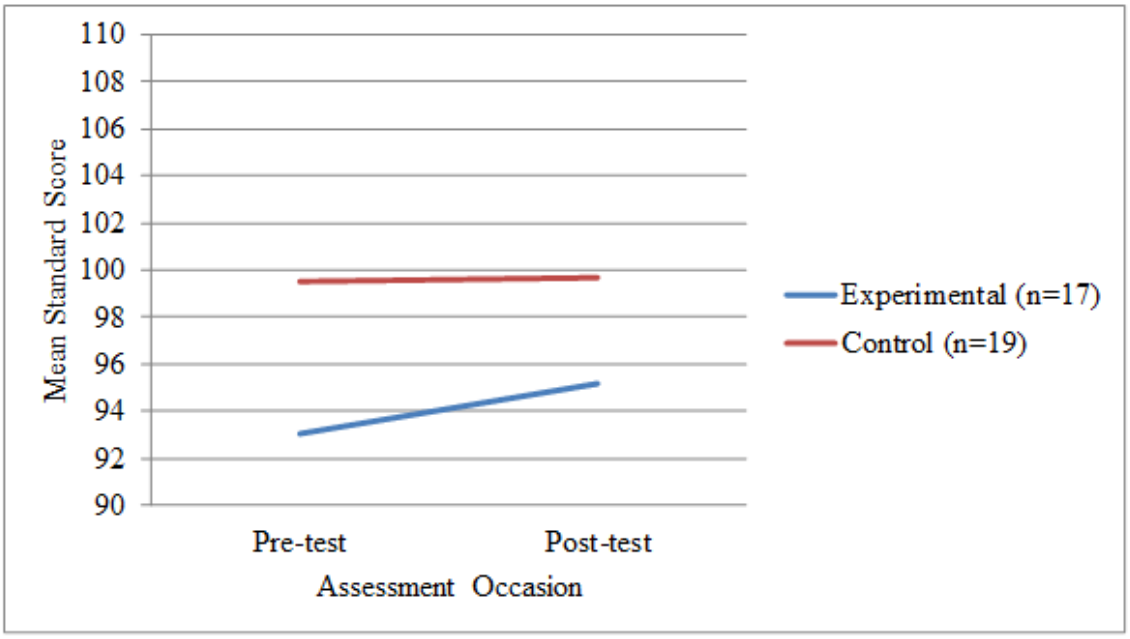

Figure 10. Experimental and Control Groups' Girls' WRAT4 Spelling Mean Standard Scores at Pre-test and Post-test ($d = 0.15$).

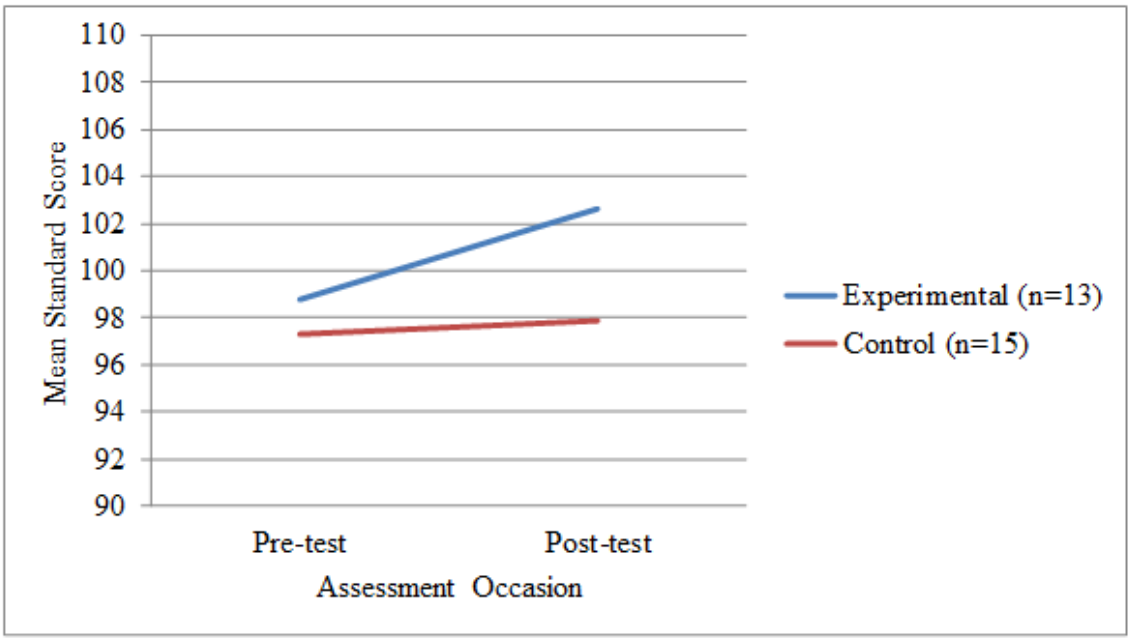

Figure 11. Experimental and Control Groups' Boys' WRAT4 Spelling Mean Standard Scores at Pre-test and Post-test ($d = 0.19$).

Math Computation. Finally, Table 7 presents the results of the paired *t*-test, Cohen's *d* effect sizes and 95% confidence intervals for the experimental and control groups on this WRAT4 subtest. Figures 12 and 13 present these results visually by gender. While the experimental group boys and girls made statistically significant gains in their math skills between the pre- and post-test assessments, the average gains made by the boys and the girls in the control group were statistically nonsignificant. The between-groups (i.e., tutoring versus control) effect sizes indicated that the *TYCW* tutoring program gave the girls in the experimental group an advantage over the boys in the experimental group and the boys and girls in the control group, on Math Computation. That is, the effect size for the girls on the Math Computation subtest was relatively large (Lipsey et al., 2012) and substantively important (WWC, 2008), as compared to the relatively small (Lipsey et al.) effect for the boys, which also fell well-below the threshold to be considered substantively important (WWC).

Mental Health Results

As with the educational results, the presentation of the mental health results will proceed as follows. First, presented in the text will be the results of the paired *t*-tests and accompanying effect sizes (i.e., Cohen's *d*) for the pre-test to post-test gains made by the girls and boys in the experimental and control groups. The corresponding table of means and standard deviations for the experimental and control groups will be presented for each mental health measure. For the CADS-P and CBCL, in addition to the tables, Figures (by gender) are also presented to help with the ease of the interpretation of the results. Second, presented in Appendix K, will be the complete findings for the RMANOVA (with time as the within-subjects factor, and group and gender as the two between-subjects factors).

Table 7.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for WRAT4 Math Computation, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	85.53	88.27	8.14	10.50	1.01	.290		
Experimental Group	13	87.46	92.77	13.07	16.09	2.93	**.013**		
Total	28	86.43	90.36	10.89	13.32			0.21	[-0.4, 0.8]
Girls:									
Control Group	19	84.32	84.68	9.27	12.39	0.22	.829		
Experimental Group	17	86.82	91.53	8.95	11.63	2.18	**.045**		
Total	36	85.50	87.92	9.08	12.36			0.41	[-0.1, 0.9]
Boys and Girls:									
Control Group	34	84.85	86.26	8.68	11.57				
Experimental Group	30	87.10	92.07	11.03	13.49				
Total	64	85.91	88.98	9.84	12.74				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

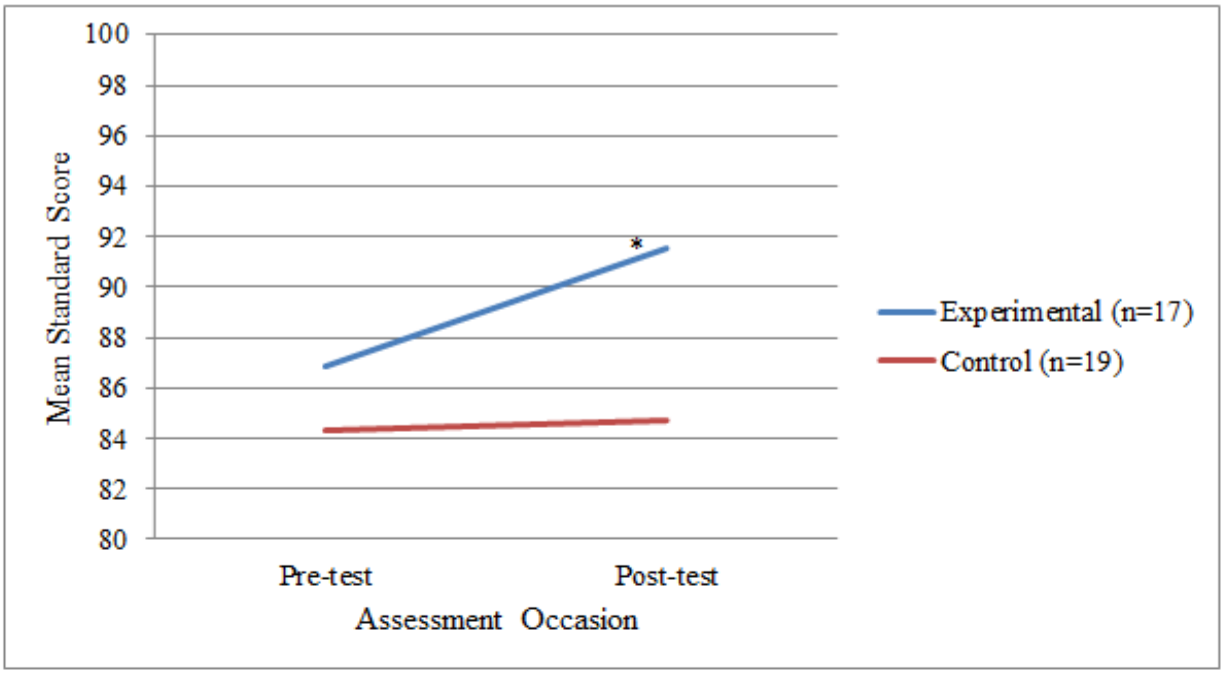

Figure 12. Experimental and Control Groups' Girls' WRAT4 Math Computation Mean Standard Scores at Pre-test and Post-test ($d = 0.41$). *$p = .045$, two-tailed.

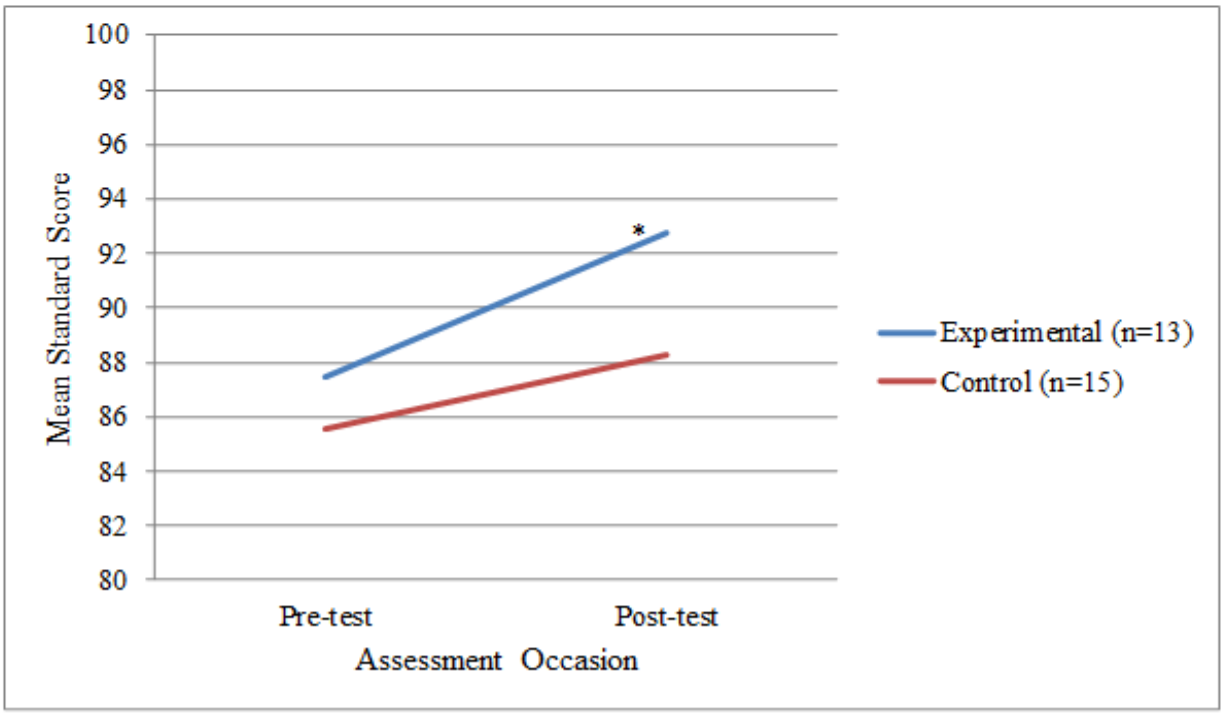

Figure 13. Experimental and Control Groups' Boys' WRAT4 Math Computation Mean Standard Scores at Pre-test and Post-test ($d = 0.21$). *$p = .013$, two-tailed.

Working Hypothesis 2: The Effect of Tutoring on Inattention/Hyperactivity as per the Conners' ADHD/DSM-IV Parent Rating Scales (CADS-P) ADHD Index T-score

Table 8 presents the paired *t*-test results along with the Cohen's *d* effect sizes and 95% confidence intervals for the results on this measure. Figures 14 and 15 present these results visually by gender. Overall, there were no significant changes in the pre-test and post-test means for the girls or boys in the experimental group, or for the girls and boys in the control group. The between-group (i.e., tutoring versus control) effect sizes indicated that there was no differential change for the boys' or girls' mean ADHD Index T-scores, between the pre-test and post-test.

Working Hypothesis 3: The Effect of Tutoring on Internalizing and Externalizing Behaviour, according to the Child Behavior Checklist (CBCL)

Internalizing subscale. Table 9 presents the paired *t*-test results, the Cohen's *d* effect sizes and 95% confidence intervals for this subscale, which assessed withdrawn and anxious/depressed behaviour and somatic complaints among the foster children (Achenbach & Rescoria, 2001), as reported by the foster parents on the CBCL. Figures 16 and 17 present these results visually by gender. Only the boys in the control group experienced a statistically significant decrease in their foster parent-reported internalizing symptoms. There were no significant changes in the pre-test-to-post-test means for the experimental group girls and boys, nor for the girls in the control group. The between-group (i.e., tutoring versus control group) effect sizes showed that there was no differential change in the mean scores of the Internalizing subscale, for either the boys or the girls.

Table 8.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for Conners' ADHD Index T-Score, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	65.20	64.67	8.53	9.87	-0.32	.755		
Experimental Group	13	61.23	58.54	12.00	10.87	-0.87	.402		
Total	28	63.36	61.82	10.29	10.62			-0.21	[-0.9, 0.4]
Girls:									
Control Group	19	69.00	68.26	14.49	14.08	-0.34	.740		
Experimental Group	17	68.82	69.88	13.28	13.94	-0.39	.703		
Total	36	68.92	69.03	13.73	13.84			-0.13	[-0.4, 0.6]
Boys and Girls:									
Control Group	34	67.32	66.68	12.21	12.36				
Experimental Group	30	65.53	64.97	13.10	13.74				
Total	64	66.48	65.88	12.56	12.95				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

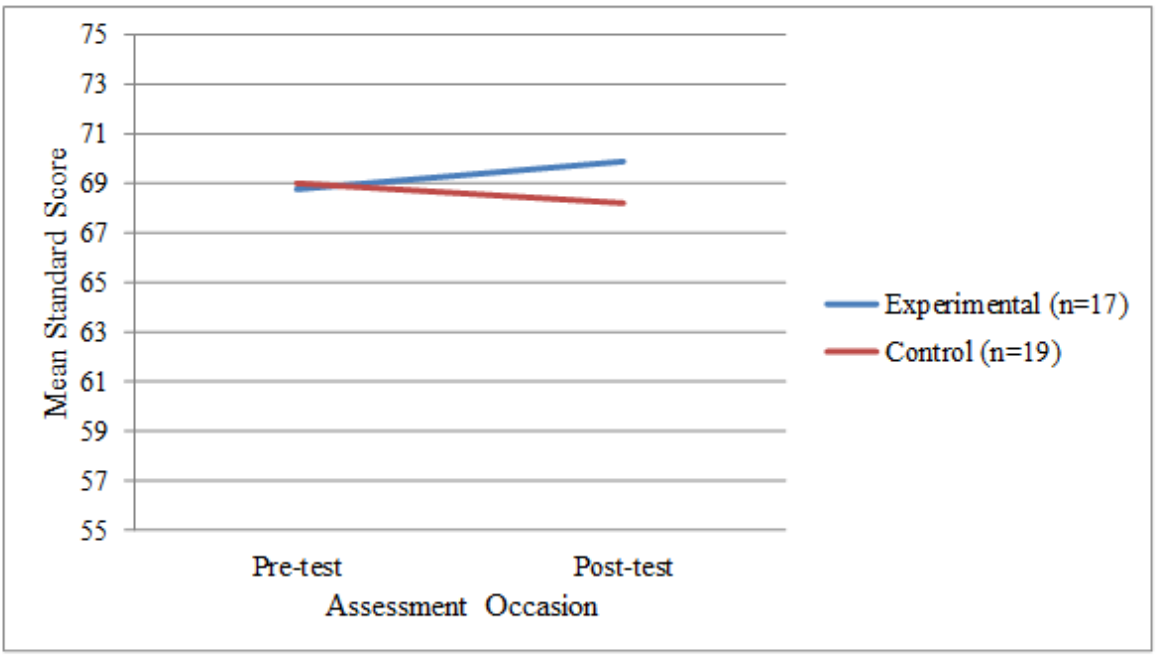

Figure 14. Experimental and Control Groups' Girls' Conners' ADHD/DSM-IV Parent Rating Scales (CADS-P)ADHD Index Mean Standard Scores at Pre-test and Post-test (d = -0.13).

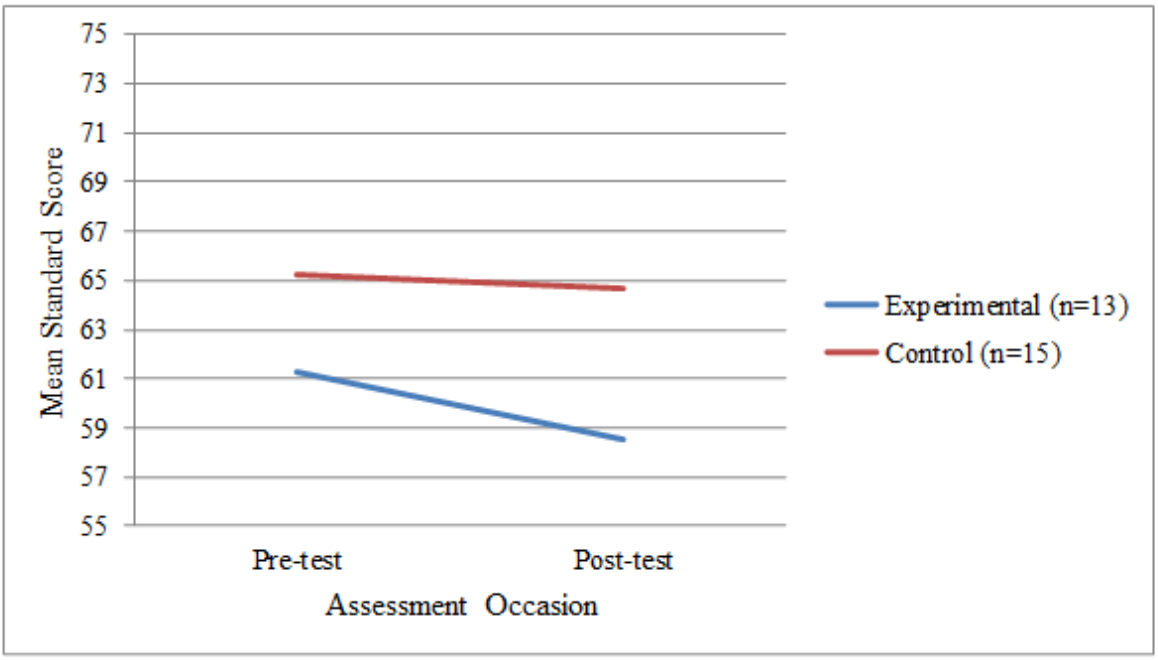

Figure 15. Experimental and Control Groups' Boys' Conners' ADHD/DSM-IV Parent Rating Scales (CADS-P)ADHD Index Mean Standard Scores at Pre-test and Post-test (d = 0.21).

Table 9.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for the Internalizing Subscale of the Child Behavior Checklist, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	60.00	55.87	9.23	11.74	-2.23	**.043**		
Experimental Group	13	53.92	51.46	11.96	13.37	-0.75	.465		
Total	28	57.18	53.82	10.83	12.49			0.14	[-0.5, 0.8]
Girls:									
Control Group	19	56.53	55.95	13.17	10.73	-0.31	.760		
Experimental Group	17	57.29	56.00	10.20	10.45	-0.89	.386		
Total	36	56.89	55.97	11.70	10.48			0.06	[-0.5, 0.3]
Boys and Girls:									
Control Group	34	58.06	55.91	11.57	11.05				
Experimental Group	30	55.83	54.03	10.93	11.81				
Total	64	57.02	55.03	11.24	11.36				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

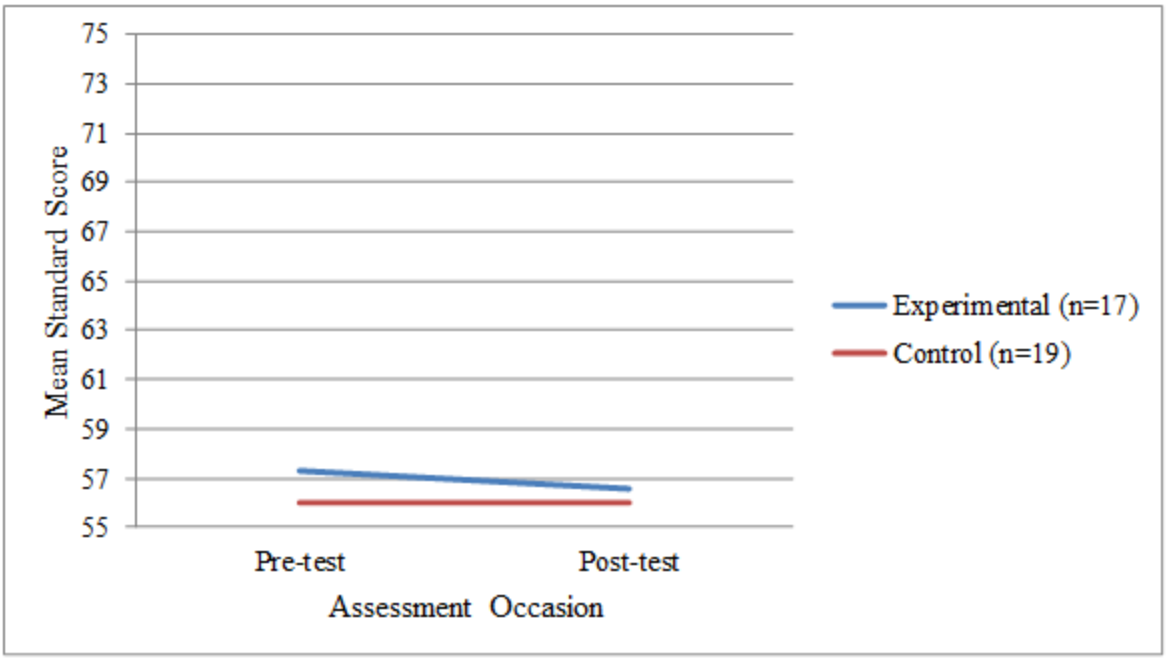

Figure 16. Experimental and Control Groups' Girls' Child Behavior Checklist Internalizing Problems Mean Standard Scores at Pre-test and Post-test ($d = 0.06$).

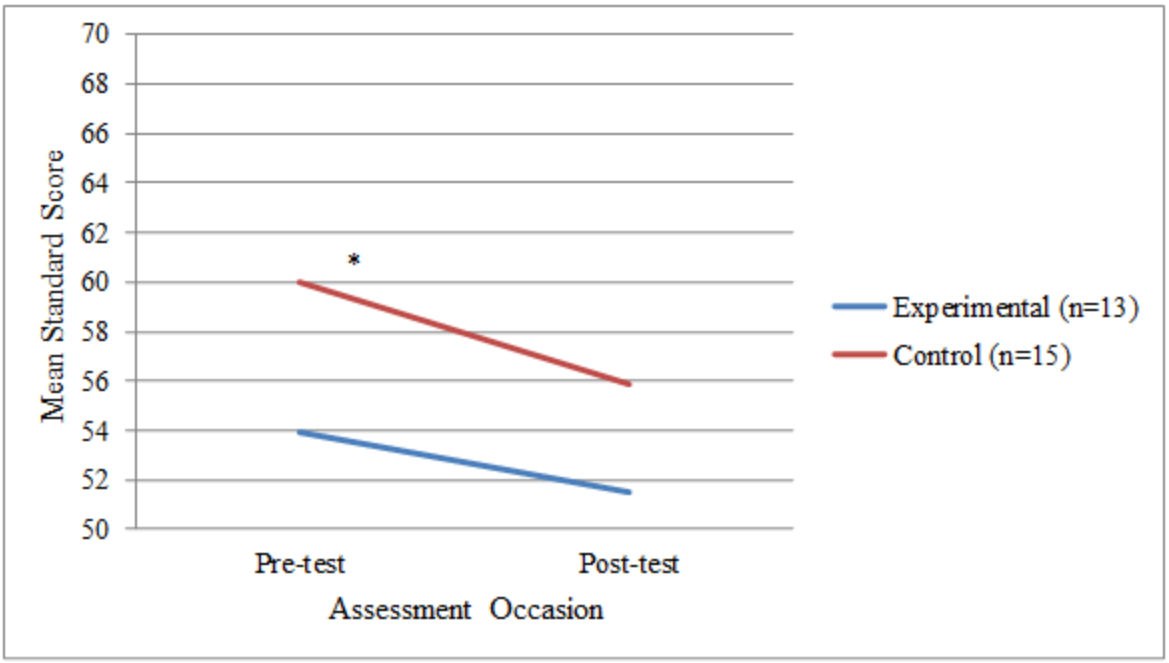

Figure 17. Experimental and Control Groups' Boys' Child Behavior Checklist Internalizing Problems Mean Standard Scores at Pre-test and Post-test ($d = 0.14$). *$p = .043$, two-tailed.

Externalizing subscale. Table 10 presents the results of the paired *t*-tests, Cohen's *d* effect sizes and 95% confidence intervals for this subscale, which assessed delinquent or aggressive behaviour among the foster children (Achenbach & Rescoria, 2001), as reported by their caregiver. Figures 18 and 19 present these results visually by gender. There were no significant differences in the externalizing-behaviour means of the girls and boys in the experimental group, nor between the means of and the girls and boys in the control group, as reported by their foster parents, between the pre-test and post-test assessments. As with the internalizing results, the between-group (i.e., tutoring versus control group) effect sizes for the externalizing subscale indicated that there was no differential impact amongst the average means for the boys or girls at post-test.

Working Hypothesis 4: The Effect of Tutoring on the Foster Children's Academic Self-Perception, per the Self-Perception Profile for Children (SPPC)

The Academic Self-Perception subscale of the SPPC (Harter, 1985) was administered only at the post-test assessment in June 2009, to assess the foster children's academic self-perception using the scholastic competence subscale scores. Due to the one-time assessment, independent-samples *t*-tests were conducted with comparisons between the mean scores for the experimental and control group boys and experimental and control group girls, respectively, to determine if there were gender differences regarding changes in academic self-perception.

Table 11 presents the results of the independent-samples *t*-test, Cohen's *d* effect sizes and 95% confidence intervals for this measure for the girls and boys in the experimental and control groups, respectively. The results demonstrated nonsignificant differences between the girls' and boys' scores. Moreover, the between-group (i.e., tutoring versus control) effect sizes showed that there was no differential impact on the boys' or girls' academic self-perception, despite the

Table 10.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for the Externalizing Subscale of the Child Behavior Checklist, by Gender and Experimental Condition.

Gender		*M*		*SD*		*t*	*p*	*d*	95% CIs
Group	*n*	Pre	Post	Pre	Post				
Boys:									
Control Group	15	65.60	63.87	11.06	12.46	-0.86	.402		
Experimental Group	13	63.15	60.15	9.33	10.74	-1.00	.338		
Total	28	64.46	62.14	10.18	11.63			0.12	[-0.8, 0.6]
Girls:									
Control Group	19	61.16	63.11	11.14	9.32	1.40	.180		
Experimental Group	17	60.94	59.94	13.12	12.82	-0.59	.566		
Total	36	61.06	60.03	11.94	11.77			0.25	[-0.6, 0.1]
Boys and Girls:									
Control Group	34	63.12	63.44	11.16	10.64				
Experimental Group	30	61.90	60.03	11.50	11.77				
Total	64	62.55	61.84	11.25	11.23				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

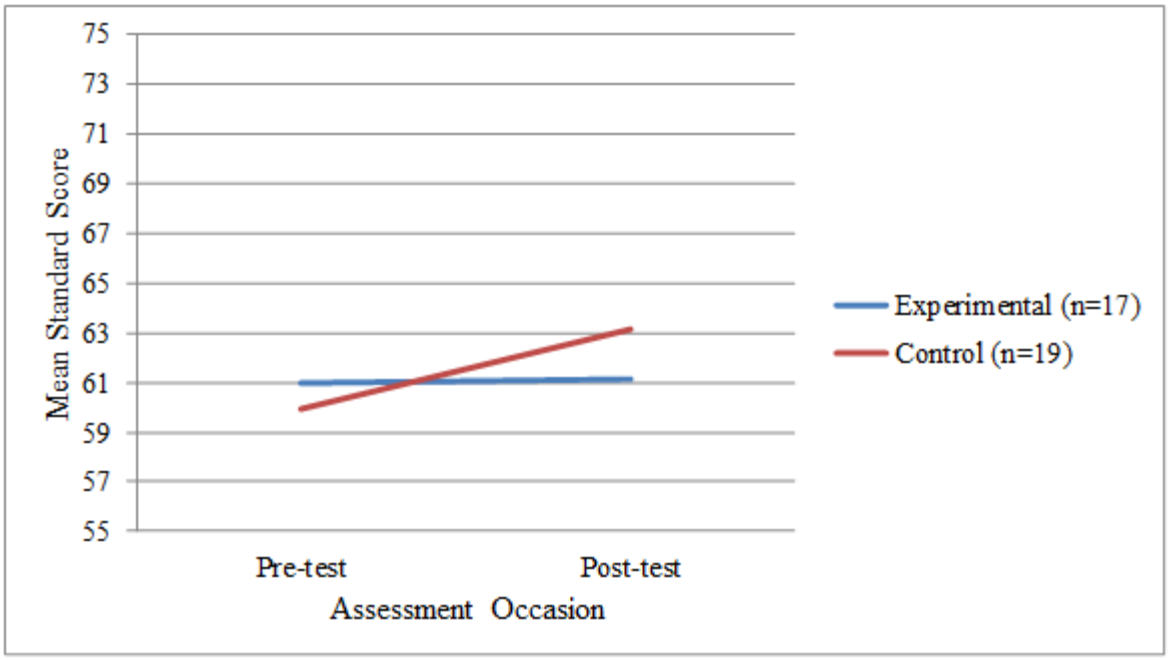

Figure 18. Experimental and Control Groups' Girls' Child Behavior Checklist Externalizing Problems Mean Standard Scores at Pre-test and Post-test ($d = 0.25$).

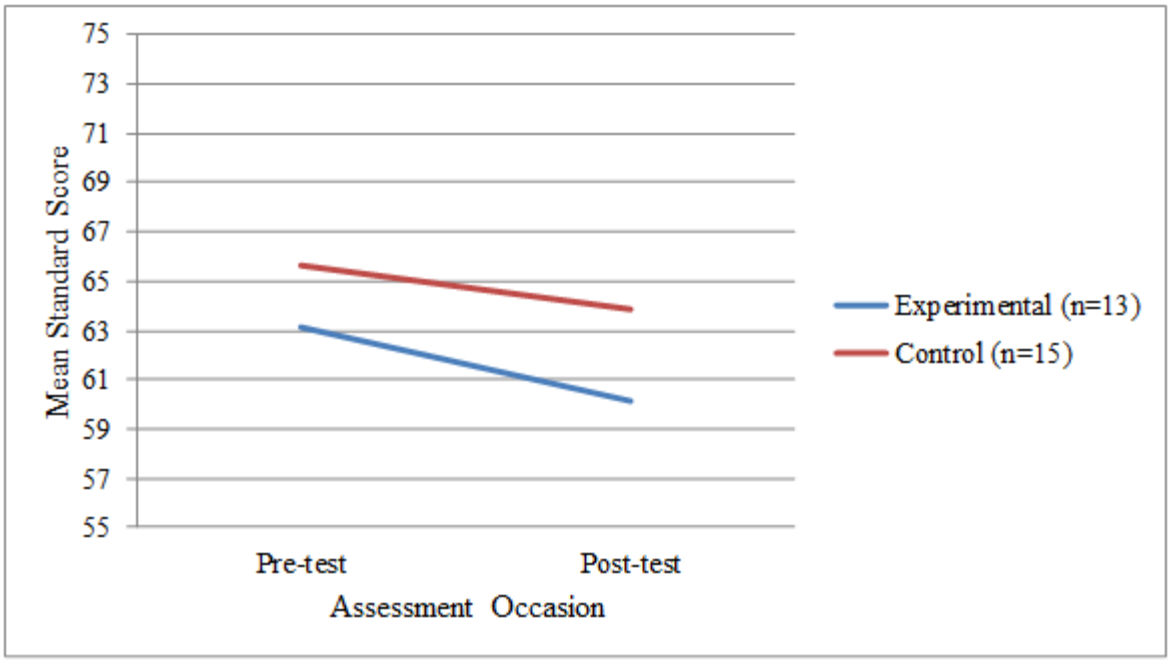

Figure 19. Experimental and Control Groups' Boys' Child Behavior Checklist Externalizing Problems Mean Standard Scores at Pre-test and Post-test ($d = 0.12$).

Table 11.

Post-test Means and Standard Deviations, and Independent Samples t-tests for the Academic Self-Perception Subscale of the Self-Perception Profile for Children, by Gender and Experimental Condition.

Gender Group	*n*	*M* Post	*SD* Post	*t*	*p*	*d*	95% CIs
Boys:							
Control Group	15	16.27	4.61				
Experimental Group	13	17.38	3.28				
Total	28	16.79	4.01	0.73	.473	0.28	[-0.5, 1.0]
Girls:							
Control Group	19	14.89	4.40				
Experimental Group	17	16.47	3.34				
Total	36	15.64	3.96	1.28	.238	0.40	[-0.3, 1.1]
Boys and Girls:							
Control Group	34	15.50	4.47				
Experimental Group	30	16.87	3.29				
Total	64	16.14	3.99				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

fact that the effect size values for both groups of children could be considered moderate (Lipsey et al., 2012) and substantively important (WWC, 2008).

Working Hypothesis 5: The Foster Children's Perceptions of the Effects of Tutoring on the Foster Child-Parent Relationship

The Alabama Parenting Questionnaire (APQ) has parallel versions for the child and caregiver. Each participating foster child was asked to complete the appropriate version of questionnaire at post-test only. Due to missing responses for two experimental group foster parents, the results of the experimental group foster children were adjusted, accordingly, prior to statistical analyses.

Positive Parenting subscale. Table 12 presents the results of the independent-samples *t*-test, along with the Cohen's *d* effect sizes and 95% confidence intervals for the experimental and control group girls and boys, respectively. This subscale assessed the foster children's perception of their foster parent's use of positive parenting techniques (e.g., rewards and encouragement). The results showed statistically nonsignificant differences for both the girls and boys in the tutoring versus control groups. The between-group (i.e., tutoring versus control group) effect sizes indicated that there was no differential impact for either the boys or girls on their perceptions of their foster parents' use of positive parenting techniques.

Parental Involvement subscale. Due to the one-time administration, Table 13 presents the independent-samples *t*-test results, Cohen's *d* effect sizes and 95% confidence intervals for the girls and boys within the experimental and control groups, respectively. This subscale asked the foster children to assess the degree to which they perceived their foster parents to be involved in their lives and daily activities (e.g., attending extracurricular activities, asks about child's day at school, etc.). The results showed nonsignificant differences between the means of the

Table 12.

Post-test Means and Standard Deviations, and Independent Samples t-tests for the Foster Children's Responses on the Alabama Parenting Questionnaire's Positive Parenting Subscale, by Gender and Experimental Condition.

Gender Group	*n*	*M* Post	*SD* Post	*t*	*p*	*d*	95% CIs
Boys:							
Control Group	15	23.27	6.38				
Experimental Group	12	23.75	3.65				
Total	27	23.48	5.25	0.25	.807[1]	0.10	[-0.7, 0.9]
Girls:							
Control Group	19	25.42	3.13				
Experimental Group	16	24.88	3.58				
Total	35	25.17	3.30	-0.48	.633	-0.16	[-0.8, 0.5]
Boys and Girls:							
Control Group	34	24.47	4.88				
Experimental Group	28	24.39	3.58				
Total	62	24.44	4.31				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.
[1]Conservative degrees of freedom were used as equal variances were not assumed

Table 13.

Post-test Means and Standard Deviations, and Independent Samples t-tests for the Foster Children's Responses on the Alabama Parenting Questionnaire's Parental Involvement Subscale, by Gender and Experimental Condition.

Gender Group	*n*	*M* Post	*SD* Post	*t*	*p*	*d*	95% CIs
Boys:							
Control Group	15	33.80	7.86				
Experimental Group	12	37.50	5.50				
Total	27	35.44	7.04	1.38	.180	0.53	[-0.2, 1.3]
Girls:							
Control Group	19	35.95	6.98				
Experimental Group	16	38.75	4.33				
Total	35	37.23	6.01	1.45	.157[1]	0.50	[-0.2, 1.2]
Boys and Girls:							
Control Group	34	35.00	7.34				
Experimental Group	28	38.21	4.81				
Total	62	36.45	6.48				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.
[1]Conservative degrees of freedom were used as equal variances were not assumed

experimental and control group girls and boys, respectively. Likewise, the between-group (i.e., experimental versus control group) effect sizes indicated no differential impact on the boys' or girls' perception of their foster parents' involvement despite the fact the values appear to be large (Lipsey et al., 2012) and are above the WWC (2008) threshold to be considered substantively important.

Working Hypothesis 6: The Foster Parents' Perceptions of the Effects of Tutoring on the Foster Child-Parent Relationship

Positive Parenting subscale. Table 14 presents the results of the independent-samples *t*-test, Cohen's *d* effect sizes and 95% confidence intervals for the foster parents of girls and boys in the experimental and control groups, respectively. The results reflect the responses of the foster parents regarding their self-perceived use of positive parenting techniques with their foster children. Contrary to expectations, the foster parents of the boys in the control group reported statistically significantly higher scores than the foster parents of boys in the experimental group. However, the differences between the means for the foster parents of the girls in the control and experimental groups were statistically nonsignificant. The between-group (i.e., tutoring versus control group) effect sizes showed that the control group boys' foster parents' responses were markedly different (i.e., more positive) than those of the girls' foster parents; the value of the between-group effect size for the boys' foster parents was very large (Lipsey et al., 2012) and well-above the WWC (2008) criteria to be considered substantively important.

Parental Involvement subscale: Foster parents' responses. Table 15 presents the results of the independent-samples *t*-test, along with Cohen's *d* effect sizes and 95% confidence intervals for foster parents of the boys and girls in the experimental and control groups, respectively. On this subscale, which is the parallel version of the children's form, foster parents

Table 14.

Post-test Means and Standard Deviations, and Independent Samples t-tests for the Foster Parents' Responses on the Alabama Parenting Questionnaire's Positive Parenting Subscale, by Gender and Experimental Condition.

Gender Group	*n*	*M* Post	*SD* Post	*t*	*p*	*d*	95% CIs
Boys:							
Control Group	15	26.67	1.92				
Experimental Group	12	23.58	3.50				
Total	27	25.30	3.10	-2.74	**.014**[1]	-1.06	[-1.9, -0.3]
Girls:							
Control Group	19	27.11	2.28				
Experimental Group	16	26.19	3.17				
Total	35	26.63	2.72	-0.99	.923	-0.34	[-1.0, 0.3]
Boys and Girls:							
Control Group	34	26.91	2.11				
Experimental Group	28	25.07	3.51				
Total	62	26.08	2.95				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.
[1]Conservative degrees of freedom were used as equal variances were not assumed

Table 15.

Post-test Means and Standard Deviations, and Independent Samples t-tests for the Foster Parents' Responses on the Alabama Parenting Questionnaire's Parental Involvement Subscale, by Gender and Experimental Condition.

Gender Group	*n*	*M* Post	*SD* Post	*t*	*p*	*d*	95% CIs
Boys:							
Control Group	15	41.73	4.42				
Experimental Group	12	38.00	5.24				
Total	27	40.07	5.07	2.01	**.055**	-0.78	[-1.6, 0.0]
Girls:							
Control Group	19	40.32	4.84				
Experimental Group	16	40.88	3.58				
Total	35	40.57	4.26	0.38	.705	0.13	[-0.5, 0.8]
Boys and Girls:							
Control Group	34	40.94	4.65				
Experimental Group	28	39.64	4.52				
Total	62	40.35	4.60				

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

were asked to rate their perceived level of involvement in the lives and daily activities of their foster children. The results indicated that there was a difference in means (in the unanticipated direction), at the level of a trend, for the foster parents of boys in the experimental and control group. That is, the results indicated that, amongst the foster parents of the boys in the study, those in the control group reported greater levels of involvement, as compared to those foster parents in the experimental group. The differences between the means for the foster parents of girls in the control and experimental groups were statistically nonsignificant. The between-group (i.e., tutoring versus control group) effect sizes indicated a differential impact amongst the foster parents of the boys and girls; the effect size for the boys' foster parents was relatively large (Lipsey et al., 2012) and substantively important (WWC, 2008).

Direct Effects and Moderation Results: Exploratory Research Questions

As previously mentioned, the results within this section are presented for the experimental group only, as they are the only participants within the study who received the *TYCW* tutoring intervention.

Research Question 1: Effect of Tutoring One Foster Child versus Two Foster Children

Table 16 presents the results of the paired *t*-test along with the effect size advantage and 95% Confidence Intervals for the effects of tutoring a single child as compared to a sibling pair. The results demonstrated that although the children who were recruited as a single child started off with lower mean scores across all five WRAT4 subtests, as compared to the children were recruited as a sibling pair, they made statistically significant gains on four of the five subtests at post-test. The foster children who were part of a sibling pair only demonstrated significant gains on the Math Computation subtest at post-test.

Table 16.

Post-test Means and Standard Deviations, and Paired Samples t-tests for the Effects of Having Received Tutoring as a Single Child or as Part of a Sibling Pair.

Participant Type at Recruitment WRAT4 Subscale	*n*	*M* Pre	 Post	*SD* Pre	 Post	*t*	*p*	*d*	95% CIs
Single Child:	48								
Word Reading		94.06	97.31	12.44	13.60	3.50	**.001**		
Sentence Comprehension		94.27	98.71	12.70	11.75	4.25	**.000**		
Reading Composite		92.96	97.15	12.56	13.00	5.40	**.000**		
Spelling		95.06	96.44	14.63	15.17	1.64	.108		
Math		84.38	86.83	10.20	12.87	2.11	**.040**		
Sibling Pair:	16								
Word Reading		105.88	104.00	18.98	11.84	-0.62	.546		
Sentence Comprehension		104.75	107.31	14.21	9.49	1.17	.262		
Reading Composite		105.06	105.44	16.49	10.70	0.16	.876		
Spelling		103.31	105.25	13.31	11.60	1.33	.205		
Math		90.50	95.44	7.16	10.20	2.24	**.041**		
Single Child vs. Sibling Pair:									
Word Reading								0.37	[0.0, 0.7]
Sentence Comprehension								0.15	[-0.2, 0.5]
Reading Composite								0.29	[-0.0, 0.6]
Spelling								-0.04	[-0.3, 0.2]
Math								-0.23	[-0.7, 0.3]

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

Regarding the mean level of change, the between-group (i.e., single child versus sibling pair) effect sizes indicated that the children who were recruited as a single child had an advantage on Word Reading, Sentence Comprehension, and Reading Composite, as compared to the children who were recruited as a sibling pair. These effects appeared to be relatively large (Lipsey et al., 2012) and substantively important (WWC, 2008). However, the foster children who were recruited as a sibling pair had a slight advantage on Math Computation, although the effects fell slightly below the benchmark to be considered moderate (Lipsey et al. 2012) or substantively important (WWC, 2008).

Research Question 2: The Moderation Effects of *TYCW* Implementation Fidelity

The team members rated 70% of the experimental group children as having received a higher level of treatment fidelity in reading and 30% as having had lower levels. The number of *TYCW* reading lessons that had been completed varied between 10 (very low) and 128 (very high), with the average (M = 63.6) being quite close to the intended number of 60. In math, 57% of the children were judged as having received a higher level of treatment fidelity and 43% as having experienced a lower level. These ratings were reassessed by the team members approximately one year after the initial fidelity ratings had been made, to check the reliability of their judgements (without knowledge or recall of the child's initial rating). In 29 out of 30 cases (97%), the re-rated level of treatment fidelity in reading was identical. No attempt was made to re-assess the initial assessment of treatment fidelity in math tutoring because the foster parent's role in supervising the child's self-paced, computer-based work in math was more informal than in reading. As a result, the research team found treatment fidelity in math tutoring to be much harder to judge reliably.

Due to small sample sizes, gender based analyses were not conducted. Thus, the current results reflect the effects of implementation fidelity on the experimental group foster children's WRAT4 subtest as a combined sample (i.e., girls and boys together) per level of implementation. Additionally, Appendix L presents some implementation-related results obtained from the foster parent questionnaire, that the experimental group foster parents at completed at the post-test assessment, which are of relevance but beyond the scope of the current analyses.

Implementation fidelity by *TYCW* Reading Curriculum. With regard to the results of the implementation fidelity for reading, Table 17 presents the results of the paired *t*-test for each of the five WRAT4 subtests, by level of reading implementation. The results demonstrated that the foster children who received higher levels of implementation of the reading tutoring made statistically significant gains on all five of the WRAT4 subtests, whereas the children who had lower levels of implementation did not.

Table 18 presents the between-group (i.e., higher versus lower fidelity) effect sizes (i.e., Cohen's *d*) and the 95% Confidence Intervals for the levels of implementation of the *TYCW* reading curriculum. The results indicated that there was some evidence of moderation; receiving higher levels of fidelity in the reading curriculum of *TYCW* program gave foster children an advantage in Math, as compared to the children who received lower levels of implementation. These effects appeared to be relatively large (Lipsey et al., 2012) and substantively important (WWC, 2008). However, on no other of the WRAT4 subtests did there appear to be any differential advantage amongst the foster children who received higher or lower levels of reading implementation.

Table 17.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for the Moderation Effects of the Teach Your Children Well's Reading Curriculum.

Level of Implementation WRAT4 Subscale	*n*	*M* Pre	*M* Post	*SD* Pre	*SD* Post	*t*	*p*
Higher Implementation	21						
Word Reading		97.05	101.19	8.91	10.44	2.67	**.015**
Sentence Comprehension		98.86	104.33	12.59	11.67	3.27	**.004**
Reading Composite		97.10	102.24	10.07	11.11	3.56	**.002**
Spelling		94.71	97.81	8.98	10.00	2.24	**.037**
Math		88.33	95.10	10.21	12.77	3.72	**.001**
Lower Implementation	9						
Word Reading		96.22	98.33	19.36	20.97	0.88	.404
Sentence Comprehension		94.89	100.78	18.51	12.90	1.70	.127
Reading Composite		94.67	98.89	19.87	17.67	1.96	.085
Spelling		97.44	99.67	24.37	23.04	1.21	.260
Math		84.22	85.00	12.93	13.12	0.50	.630

Note: the *p*-values are represented as two-tailed. Bolded values represent statistically significant results.

Table 18.

Implementation Fidelity Effect-Size Advantage (Cohen's d) for the Moderation Effects of Implementation Fidelity of the Teach Your Children Well's Reading Curriculum.

WRAT4 Subscale	*n*	*d*	95% CIs
Word Reading	30	0.15	[-0.2, 0.5]
Sentence Comprehension	30	0.03	[-0.4, 0.5]
Reading Composite	30	0.07	[-0.4, 0.3]
Spelling	30	0.06	[-0.4, 0.3]
Math	30	0.50	[-0.9, -0.1]

Implementation Fidelity by *TYCW* Math Curriculum. Table 19 presents the results of the paired *t*-test along with the effect size advantage and 95% Confidence Intervals for the moderating effects of implementation fidelity in the math curriculum of the *TYCW* tutoring program. The results showed a similar trend noted amongst the results for reading fidelity; the foster children who received higher levels of exposure to the math curriculum made statistically significant gains on the WRAT4 Math Computation subtest, between pre-test and post-test, while the gains made by those foster children who received lower levels of exposure were nonsignificant. The between-group (i.e., higher versus lower fidelity) effect size indicated that there was a moderating effect of the level of implementation; receiving higher levels of implementation in the *TYCW* math curriculum gave foster children an advantage over those foster children who received lower levels of implementation—effects that could also be considered relatively moderate (Lipsey et al., 2012) and substantively important (WWC, 2008).

Research Questions 3 and 4: Moderating Effects of Mental Health on WRAT4 Outcomes

The moderating effects of mental health on the foster children's academic skills, as assessed by the WRAT4 subtests, were also investigated. Given that these analyses were secondary in interest to the moderating effects of gender, only a general overview of the results is presented, in which the CADS-P ADHD Index T-score and the CBCL Total Problems T-score were used as moderators. In order to continue to use the same RMANOVA method of analyses, the two T-scores were dichotomized at their medians[6], to obtain 'higher' and 'lower' levels of mental health. This dichotomization process allowed for the use of the same RMANOVA, with one within and two between factors, as had been used with the gender analyses (these results are presented in Appendix M). Thus, scores that were at or above the median T-score for the

[6] Even though a median split will result in a loss of power, this method of dichotomizing higher and lower levels of mental health was chosen because it provides a relatively even '50/50' split in T-scores as compared to a mean split in which there is a greater risk of an uneven split in the case of a skewed distribution of scores.

Table 19.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for the higher versus lower levels of implementation fidelity of the Math Curriculum of the Teach Your Children Well Tutoring Program (as assessed by WRAT4 Math Computation Scores).

WRAT4 Subscale Level of Implementation	*n*	*M* Pre	 Post	*SD* Pre	 Post	*t*	*p*	*d*	95% CIs
Math Computation									
Higher Level of Fidelity	17	87.29	93.94	10.60	13.40	3.03	**.008**		
Lower Level of Fidelity	12	86.83	83.25	12.54	14.30	1.50	.163		
Higher vs. Lower Fidelity								0.33	[-0.1, 0.8]

Note: the *p*-values are represented as two-tailed, unless otherwise specified. Bolded values represent statistically significant results.

ADHD Index or the Total Problems score were categorized as "higher" levels of mental health difficulties (i.e., 'worse mental health), while scores that were below the median T-score were classified as "lower" levels of mental health difficulties (i.e., better mental health). As with the other WRAT4 results, the paired *t*-tests were conducted even when the multivariate interactions were nonsignificant, allowing for a full exploration of the results. To conserve power, these analyses were conducted on the experimental and control groups as a whole, rather than by gender, for which the sample sizes were particularly small. Due to small sample sizes while looking at the higher versus lower levels of mental health, to preserve power only the group-by-mental health analyses are reported.

Research Question 3: Moderating Effects of ADHD. As previously mentioned, Appendix M presents the results and corresponding tables for the RMANOVA results. The paired *t*-test analyses revealed that the foster children in the experimental group had made pre-test-to-post-test gains on all of the WRAT4 subtests with the exception of Spelling, regardless of their pre-test level of ADHD (see Table 20). More specifically, experimental group foster children who had higher levels of ADHD at pre-test made statistically significant gains on three of the five WRAT4 subtests, including Word Reading, Reading Composite and Math Computation, and trend-level gains on Sentence Comprehension and Spelling. Likewise, foster children in the experimental group who had lower levels of ADHD at pre-test also made statistically significant gains on three of the five subtests, including Sentence Comprehension, Reading Composite and Math Computation. In contrast to the experimental group, the foster children in the control group did not attain statistically significant pre-test-to-post-test gains on any of the WRAT4 subtests regardless of whether they had higher or lower ADHD at pre-test.

Table 20.

Pre-test and Post-test Means and Standard Deviations, and Paired t-tests for the Moderating Effects of Conners' ADHD Index T-Scores on WRAT4 Outcomes.

'Level' of ADHD T-Score Group / WRAT4 Subscale	*n*	*M* Pre	*M* Post	*SD* Pre	*SD* Post	*t*	*p*
Higher ADHD T-Scores							
Experimental Group:	15						
Word Reading		96.13	99.80	11.43	13.99	2.30	**.038**
Sentence Comprehension		95.80	100.33	14.78	11.92	2.05	.060
Reading Composite		94.80	99.20	13.30	12.41	2.81	**.014**
Spelling		97.87	100.47	16.58	16.93	2.05	.060
Math		85.27	89.33	12.90	14.38	2.13	**.051**
Control Group:	23						
Word Reading		95.74	96.26	16.82	13.23	0.33	.743
Sentence Comprehension		92.78	96.52	12.22	10.66	2.53	**.019**
Reading Composite		93.00	95.43	14.80	12.37	1.97	.062
Spelling		98.30	97.61	13.60	13.87	-0.64	.531
Math		84.74	84.35	7.55	9.89	-0.26	.800
Lower ADHD T-Scores							
Experimental Group:	15						
Word Reading		97.47	100.87	14.00	14.64	1.63	.125
Sentence Comprehension		99.53	106.20	14.26	11.61	3.10	**.008**
Reading Composite		97.93	103.27	13.83	14.04	2.94	**.011**
Spelling		93.20	96.27	13.09	12.31	1.67	.117
Math		88.93	94.80	8.86	12.43	2.69	**.018**
Control Group:	11						
Word Reading		100.27	101.00	18.40	12.11	0.19	.854
Sentence Comprehension		103.36	103.36	13.30	11.93	0.00	1.000
Reading Composite		101.18	101.64	16.46	12.45	0.18	.860
Spelling		99.00	101.55	17.07	17.73	1.60	.141
Math		85.09	90.27	11.11	14.14	1.82	.099

Note: the *p*-values are represented as two-tailed, unless otherwise specified. Bolded values represent statistically significant results.

However, the exception to these aforementioned results is Sentence Comprehension, on which the foster children in the control group who had higher levels of ADHD made significant gains.

Table 21 presents the effect-size advantage on the WRAT4 subscales for experimental- versus control-group children, at higher versus lower levels of pre-test inattention/hyperactivity, as assessed by Conners' ADHD Index T-score. The results indicated that there was some evidence of moderation by pre-test level of ADHD among the foster children who had lower pre-test ADHD Index T-scores on Sentence Comprehension, as the experimental group versus control group effect size was (d = 0.52) for those with lower pre-test levels of ADHD and (d = 0.07) for those who had higher pre-test levels. On the other hand, there was some evidence that there was a comparative advantage for the foster children in the control and experimental groups who had higher levels of pre-test ADHD on Math Computation (d = 0.41) and a slight hint of an advantage on Spelling (d = 0.22), versus those with lower pre-test levels (d = 0.06) and (d = 0.04), respectively.

Research Question 4: CBCL's Total Problems as a moderator. Paired *t*-tests suggested that, regardless of their pre-test level of Total Problems, the children in the experimental group had made significant gains on all of the WRAT4 subtests (see Table 22). More specifically, in the experimental group, foster children who had higher CBCL Total Problems T-scores at pre-test made statistically significant gains on Word Reading, Reading Composite and Spelling by the post-test in June 2009, while those with lower Total Problem T-scores at pre-test made significant gains on Sentence Comprehension, Reading Composite and Math Computation. In contrast to the experimental group, the foster children in the control group who had higher CBCL Total Problem T-scores at pre-test made statistically significant gains on only one of the five WRAT4 subtests, namely, Sentence Comprehension by the post-

Table 21.

Effect-Size Advantage (Cohen's d) on WRAT4 Subscales of Tutoring versus Control Children, at Higher versus Lower Levels of Pre-test Mental Health (as assessed by Conners ADHD Index T-score).

WRAT4 Subscale	*n*	*d*	95% CIs
Higher ADHD	38		
Word Reading		0.22	[-0.1, 0.5]
Sentence Comprehension		0.07	[-0.3, 0.5]
Reading Composite		0.15	[-0.1, 0.4]
Spelling		0.22	[-0.0, 0.4]
Math Computation		0.41	[-0.0, 0.8]
Lower ADHD	26		
Word Reading		0.18	[-0.3, 0.7]
Sentence Comprehension		0.52	[0.1, 0.9]
Reading Composite		0.11	[-0.1, 0.7]
Spelling		0.04	[-0.3, 0.4]
Math Computation		0.06	[-0.5, 0.6]

Table 22.

Pre-test and Post-test Means, Standard Deviations, and Paired t-test values for the Moderation Effects of Child Behavior Checklist Total Problems T-Score on WRAT4 Outcomes.

'Level' of Total Problems T-Score Group / Subscale	*n*	*M* Pre	*M* Post	*SD* Pre	*SD* Post	*t*	*p*
Higher Total Problems T-Score							
Experimental Group:	14						
Word Reading		96.93	100.64	11.69	14.60	2.21	**.046**
Sentence Comprehension		98.93	101.50	12.69	11.76	1.39	.187
Reading Composite		96.93	100.29	12.16	12.59	2.42	**.031**
Spelling		99.64	103.00	17.27	16.72	2.70	**.018**
Math		87.57	90.14	12.99	14.13	1.48	.162
Control Group:	17						
Word Reading		99.06	98.60	17.93	13.44	-0.23	.819
Sentence Comprehension		94.00	98.12	13.75	9.94	2.67	**.017**
Reading Composite		95.65	97.53	16.13	12.06	1.39	.184
Spelling		101.18	100.71	14.27	14.40	-0.32	.754
Math		84.88	85.35	7.51	9.61	0.26	.800
Lower Total Problems T-Score							
Experimental Group:	16						
Word Reading		96.69	100.06	13.69	14.08	1.71	.107
Sentence Comprehension		96.56	104.81	16.07	12.26	3.72	**.002**
Reading Composite		95.88	102.06	14.82	14.04	3.38	**.004**
Spelling		91.94	94.31	11.81	11.75	1.34	.202
Math		86.69	93.75	9.41	13.13	3.32	**.005**
Control Group:	17						
Word Reading		95.35	97.00	16.78	12.68	0.65	.524
Sentence Comprehension		98.41	99.35	12.99	12.93	0.57	.576
Reading Composite		95.88	97.06	14.76	15.94	1.04	.387
Spelling		98.30	97.61	13.60	13.87	-0.64	.313
Math		84.82	87.82	9.96	13.48	1.05	.310

Note: the *p*-values are represented as two-tailed, unless otherwise specified. Bolded values represent statistically significant results.

test in June 2009. The foster children in the control group, who had lower CBCL Total Problem T-scores at pre-test, did not make statistically significant gains on any of the five WRAT4 subtests.

Table 23 presents the effect size advantage on WRAT4 subscales of tutoring versus control-group children at higher versus lower levels of pre-test Total Problem T-scores. The results indicated that there was some evidence of a moderating effect of pre-test levels of Total Problems on WRAT4 outcomes. More specifically, foster children who had lower pre-test Total Problems T-scores appeared to have an advantage on Sentence Comprehension and a slight advantage on Math Computation, as compared to the foster children who had higher levels of Total Problems. In contrast, the results also indicated that the foster children who had higher pre-test Total Problems T-scores had a very slight advantage on Spelling, as compared to children with lower pre-test T-scores.

Research Question 5: Direct Effects of WRAT4 Gain Scores on Mental Health Outcomes

Linear regression analyses were conducted to determine if there were any associations between the foster children's WRAT4 gain scores and their mental health outcomes. With the foster children's post-test scores on the CADS-P ADHD Index T-score and the CBCL Total Problems T-score as the criterion variables, we entered their pre-test scores on these two variables and the five WRAT4 gain scores as predictors in 10 (i.e., 5 gain scores x 2 criterion variables) linear regression models. As Table 24 shows, the Reading Composite gain score predicted, at the level of a trend, a *higher* (rather than lower) post-test CBCL Total Problems T-score. On the other hand, the Math Computation gain score predicted a significantly *lower* post-test CBCL Total Problems T-score and also, at the level of a trend, a lower post-test Conners' ADHD Index T-Score.

Table 23.

Effect-Size Advantage (Cohen's d) on WRAT4 Subscales of Tutoring versus Control Children, at Higher versus Lower Levels of Pre-test Mental Health (as assessed by Child Behavior Checklist's Total Problems T-Score).

Level of Total Problems / WRAT4 Subscale	*n*	*d*	95% CIs
Higher	31		
Word Reading		0.28	[-0.0, 0.6]
Sentence Comprehension		-0.13	[-0.5, 0.2]
Reading Composite		0.11	[-0.2, 0.4]
Spelling		0.25	[-0.0, 0.5]
Math Computation		0.19	[-0.3, 0.7]
Lower	33		
Word Reading		0.12	[-0.3, 0.5]
Sentence Comprehension		0.54	[0.1, 0.9]
Reading Composite		0.31	[-0.1, 0.7]
Spelling		0.09	[-0.2, 0.4]
Math Computation		0.41	[-0.1, 0.9]

Table 24.

WRAT4 gain scores as predictors of change in Conners' ADHD/DSM-IV Parent Rating Scales ADHD Index T-Score and the Child Behavior Checklist Total Problems T-scores at post-test, using Linear Regression.

WRAT4 Subtest Gain scores	n^*	Conners' ADHD Index T-Score (Post) β	*p*	CBCL Total Problems T-score (Post) β	*p*
Word Reading	63	.01	.938	.07	.316
Sentence Comprehension	63	.07	.464	.11	.147
Reading Composite	63	.04	.639	.13	.086
Spelling	63	-.00	.964	.08	.279
Math Computation	63	-.15	.098	-.15	**.035**

* *N* = 63 for the CBCL due to an outlier that was removed from the analyses due to high residual scores.

Note: The pre-test scores for the two criterion variables were also in the respective regression models. These βs are not shown.

The *p*-values are represented as two-tailed, unless otherwise specified. Bolded values represent statistically significant results.

Research Questions 6 and 7: Moderation Effects of TYCW Reading Curriculum Dosage Level and Foster Child Cooperativeness

Exploratory analyses indicated that, within the tutoring group, two process variables predicted greater gains in math computation (but not on any of the WRAT4 reading subtests): the coverage of a greater number of reading lessons, and the level of cooperativeness of the foster child with the foster parent-tutor. When these two process variables (assessed as of the post-test) and the child's pre-test math computation score were used together in a regression equation to predict the child's post-test math computation score, they added 7.5% to the total amount of variance explained in the post-test math score. Either predictor added a significant increment ($p \leq .042$) when added alone, but, because their degree of mutual correlation was moderately strong ($r(26) = .52$, $p = .004$, 2-tailed), neither was statistically significant when added to the equation together.

Qualitative-Based Results

The following results are based upon the information obtained from the responses provided by the experimental group participants to the open-ended questions posed to them by the research team at the post-test. Thus, these results are qualitative in nature.

Research Question 8: Perceived Impact of TYCW on Reading and Math Homework

As previously noted, the participants in the experimental group (i.e., the foster children and their respective foster parents) were asked several open-ended questions at the post-test. Two of the questions posed to the foster children pertained to their perceptions of the effects of the tutoring on their ability to do their reading and math homework since completing the tutoring. Twenty-eight of the 30 (17 girls, 11 boys) experimental-group foster children provided verbal responses for the following qualitative questions. The open-ended questions were *not* asked to

two boys, due to their attrition from the experimental group prior to the end of the 30-week intervention—this decision was made by the research team prior to the start of the post-test assessments based on the rationale that these two participants and their respective foster parents did not complete the full-course of the intervention and therefore would not be asked about their perceived impact of the tutoring program. However, these participants were not excluded from the quantitative analyses because it was deemed, ahead of time, that, despite their early withdrawal from the study, they had received a sufficient number of tutoring lessons to permit their participation in the post-test assessment of their academic skills and mental health.

In these qualitative analyses, kappa was used to assess the level of inter-rater agreement. According to Fleiss, Levin and Paik (2003), a kappa (κ) value of .75 or greater is an indication of excellent agreement beyond chance, values between.40 and.75 represent a fair to good agreement beyond chance, and values of .40 or less suggest poor agreement between raters beyond chance.

Did the foster child perceive greater ease in completing reading homework after receiving the tutoring (*n* = 28)? The two team members who rated the responses to this question agreed on 95% (κ = .84) of the categorizations of the foster children's responses. For the two cases where there was disagreement, reconciliation was obtained upon discussion and review of the transcript. The conservative agreement was that the two responses were more accurately categorized under "no change" rather than "a positive change".

The reconciled responses indicated that 17 foster children had reported experiencing greater ease in doing their reading homework after receiving the tutoring intervention, and 10 of the children stated there had been no change. More specifically, 65% of the girls and 60% of the boys described a positive change in their ability to complete their reading homework. The rest of

the children (35% of the girls and 40% of the boys) indicated they did not perceive any difference in their abilities to complete their reading homework. None of the children implied a negative impact of the tutoring on their ability to complete their reading homework.

Did the foster child perceive greater ease in completing math homework after receiving the tutoring (*n* = 28)? The two team members who rated the responses to this question agreed on 96% (κ = .93) of the categorizations of the foster children's responses. Thus, there was disagreement on only one case, which was reconciled and moved from a "positive change" to "no change". The reconciled findings are described.

With regard to their perceived ability to complete their math homework after having received the tutoring intervention, 16 children indicated a positive change; 59% of the girls and 54% of the boys responded by saying it was easier to complete their math homework, since having received the tutoring. The rest of the children (41% of the girls and 46% of the boys) said they did not perceive any change in their math homework abilities. None of the children noted a negative impact of the tutoring on their ability to complete their math homework.

Research Question 9: Perceived Impact of TYCW on Foster Child-Parent Relationship

The experimental group foster children and parents were also asked for their perception of whether participating in the tutoring together had an impact on their parent-child relationship. For the two questions that asked about the foster child-parent relationship, there were different sample sizes; two foster parent-child duos (one girl, one boy) were not able to comment on any perceived change in their relationship because the foster children were tutored by an adult other than their foster parent. Therefore, the answers for those questions reflect the responses the experimental group foster parents for 26 of the 30 foster children (16 girls, 10 boys).

Did the foster children perceive an impact of the tutoring on their relationship with their foster parent(s) who did the tutoring with them (*n* = 26)? The two research team members agreed on 92% (κ = .71) of the categorizations of the foster children's responses. Four responses were reconciled, with agreement that three responses were more accurately categorized as "no change" versus "positive change", while the other response should have been categorized as "positive change" rather than "no change".

Upon reconciliation, 14 of the 25 (56%) experimental group foster children reported there was a positive change in their relationship with the foster parent who did the tutoring with them, after receiving the tutoring intervention. More specifically, 50% of the girls and 67% of the boys provided a response that indicated there was a positive change in their relationship with their foster parent(s). The other 50% of the girls stated that they did not perceive any change to their foster parent-child relationship, while 22% of the boys reflected similar sentiments. One boy (11%) perceived a negative impact of the tutoring on his relationship with his foster parent.

Did the foster parents perceive an impact of the tutoring on their relationship with their foster children (*n* = 26)? There was an 85% agreement (κ = .68) between the two research team members regarding the categorization of the foster parents' responses to this question. Upon discussion, it was agreed that three responses more accurately reflected a "no change" rather than a "positive change" categorization, while the other response was re-categorized as a "positive change" from "no change".

The reconciled responses indicated that 15 of the 26 (58%) foster parents responded by saying that they had perceived a positive change in their relationship with their foster child after having tutored him/her. That is, the foster parents of 50% of the girls and 70% of the boys reported a perceived positive change. The foster parents of 50% of the girls and 20% of the boys

stated that they did not notice any change in their relationship with their foster child after having completed the first year of tutoring with them. One foster parent (10%) mentioned that the tutoring had a negative impact on their relationship with their foster son. However, this foster parent is not the caregiver to the foster boy, who also indicated a negative impact of the tutoring on his relationship with his foster parent.

Research Question 10: Foster Parent's Perception of an Impact of the Tutoring on their Foster Children's Emotional Well-Being and Behaviour (*n* = 26)

The experimental group foster children and parents provided their perception for the open-ended questions pertaining to the impact of the tutoring program on the child's well-being and on the foster child-parent relationship. There was an 89% agreement ($\kappa = .81$) between the two research team members on the categorizations of the foster parents' responses to this question. Upon reconciliation, three responses were re-categorized as "no change" from "positive change".

With reconciliation, 14 foster parents were judged to have perceived a positive change in their foster children's well-being and behaviour after having received the tutoring; that is, approximately 47% of the foster girls and 55% of the boys demonstrated a positive improvement in their behaviour and well-being by the post-test assessment. The foster parents did not perceive any change in 41% of the foster girls or 36% of the foster boys by the end of the first intervention year, while three foster parents reported observing a negative impact of the tutoring on their foster daughters (12%) and foster son (9%).

Research Question 11: Reactions of the Experimental Group Participants' Experience with the TYCW Tutoring Program

This section presents what the experimental group participants said about their experiences with the *TYCW* tutoring program. The data were drawn from the qualitative questions posed at the end of the post-test assessment with the foster children (n = 28) and the foster parents (n = 24[7]), respectively. A majority of the foster parents elaborated on their answers and provided additional information about their experience with the *TYCW* tutoring program and the impact it had on different aspects of their lives, a rather common occurrence within the context of qualitative research with adults (Borger, de Leeuw, & Hox, 2000). Relative to the adults, the children (aged 6-13 years) did not elaborate as extensively as did the foster parents in their responses, as would be expected from their cognitive-developmental level (Borgers et al., 2000). Therefore, the numbers of children reflected in the responses below might seem lower in some categories (i.e., categories of responses that were generated from participants' elaborations on questions, such as, for example, what they liked or disliked about the tutoring program) than others (i.e., the responses to questions directly asked, such as, if they perceived a change in their ability to do their reading and math homework since having received the tutoring).

The responses of the foster children and foster parents were categorized into two broad themes; impact of the tutoring and tutoring program-related factors. These themes were subsequently divided into subcategories (Hsieh & Shannon, 2005), including their perceived impact of having received the tutoring on the children's school performance, self-esteem and

[7] The sample size for the foster parents is smaller than that for the foster children because there were four sibling pairs included in the study, resulting in more children than parents. The responses within this section reflect the experiences of the 24 foster parents who delivered the tutoring program to their foster children through to the end of the intervention year 1.

confidence, and the foster child-parent relationship, and what they liked and did not like about the *TYCW* program. Some of the foster parents' responses could not be categorized into one of the two aforementioned themes, thus, an additional category entitled 'additional information' was established and includes suggestions for future studies/tutoring initiatives and general impression from the tutoring experience. A summary of the qualitative responses provided by the experimental group participants within each of the aforementioned theme and subtheme categories are presented below, with direct quotes provided from both the foster children and foster parents to help explicate their respective perceptions.

Perceived impact of the *TYCW* tutoring program on the child's school performance. A majority of the foster children and foster parents noted the positive gains made by the children in their academic performance. Supporting the incidental reports of the children's improved reading and mathematical abilities, a number of the foster children (n = 9) and the foster parents (n = 13) also noted that the children were demonstrating improved reading comprehension, and math and spelling test scores, as well as better grades on their report cards. Furthermore, several foster parents (n = 6) noted that their foster children's teachers had observed positive changes in the child, including improved performance, confidence and behaviour in the classroom.

> *"Before I did the tutoring, I had lots of trouble doing math at school and had some trouble doing reading, but, like, I'm good at it now. And, when I was reading, there'd be lots of hard words I wouldn't know and I would, like, try to ask what the definitions meant and sometimes, I'd be scared to ask, like, I felt like I was saying silly questions all of the time "*
>
> *—Foster Child*

> *"He seems to have calmed down more. He seems to be doing better in school as I've talked to his teacher and they say his reading has improved quite a bit and he has moved up a couple of grades and he seems to be better behaved in school, according to the teachers. He gets along better with the kids in school. I don't really hear any negative things about other students from him anymore"—Foster Parent*

Perceived impact of the *TYCW* tutoring on the child's self-esteem and confidence. In addition to their improved school-performance, there was agreement amongst a majority of the foster children and foster parents that the experience of having received the *TYCW* tutoring program has a positive impact on the child's self-esteem and self-confidence. According to the foster children's responses, after having received the tutoring intervention, a few perceived a positive change in their abilities to communicate with others and in their sense of self. That is, three foster children stated that the *TYCW* program helped them speak more clearly so others, including adults and their peers, could understand them, and that they now had the confidence to ask adults to help them understand words that they did not previously comprehend.

> *"My friends now actually know what I'm talking about. Before, when I didn't have these lessons, they would always be like, 'what are you talking about? I have no clue what you're talking about'. So, um, I'm actually happy that I've had the lesson to help me [better express myself]."—Foster Child*

> *"Whenever my mom and dad talk to me and they use words that I don't understand, all I have to do is ask them what it means […]it sinks in, I can understand when they explain it to me"—Foster Child*

The foster children spoke of having increased confidence in their reading abilities; a few children (n = 3) mentioned that they used to read very easy books but, since having done the tutoring, they are now reading books with several chapters—a perspective shared by several of the foster parents. Other children stated that they did not feel they were as "grumpy" as they had been before the tutoring because they felt as though they were doing better overall, in school and when engaged in social activities, while some children said that they noticed improvement in their own behaviour.

> *"I feel more confident now. I'm not as grumpy as […] I was. I'm proud of my math, my work at school, reading, and things I do at school, like poetry and my writing. My [foster] mom tells me she's proud of me, too"—Foster Child*

The foster parents' responses echoed many of the same themes and sentiments as those of the foster children with regard to improved self-esteem, self-confidence, and improved social skills and behaviour. For example, two foster parents spoke about the children's increased confidence in their reading abilities, which, in turn, had increased their self-esteem. Other foster parents (n = 3) stated that, with the improvements in their academic skills, their foster children not only behaved better, but they also now demonstrate better emotion-regulation skills.

> *"He just seems to be happier, he's calmed down a lot"—Foster Parent*

> *"More so than the academics for her, it was the building of confidence and peer acceptance, through that. The improvement in [her] ability and confidence; she's performing and achieving at her peers' level, whereas before, she was in remedial level, almost 2 years behind and now with her confidence and peer acceptance, the response that we're getting from her principal and teacher at school is that she has done an amazing improvement and has almost become a new person in her abilities and her confidence and achievements. The peer acceptance and her ability to socialize has really improved and has made her a much happier child. The last comment I got from the principal was, 'whatever you and [her foster father] are doing with this child, continue to do it, she's blossomed'"—Foster Parent*

> *"Without her even knowing, it does build her self-esteem. I mean, for years, she ran around with a book in her hand pretending that she could read but now, she can actually read"*
> *—Foster Parent*

Although the tutoring program appeared to elicit positive effects on the foster children's well-being, several foster parents indicated that there had also been some negative consequences of the program. In general, these foster parents reported that they had observed the experience of being tutored to be particularly stressful and tiresome, eliciting feelings of anger and frustration amongst their foster children. For example, three children reportedly broke down in tears on a regular basis when they did not understand a lesson or did not achieve their goal during a fluency test, while other children became so anxious and frustrated that they were described by their

foster parent as becoming 'hysterical'. On such occasions, the foster parents said that they had to stop the tutoring for the day or week, depending on the severity of the child's reaction.

> *"There were times when she was just crying out of frustration, so, on those days, we just had to walk away from it"—Foster Parent*

Moreover, two foster parents indicated that the tutoring was so time consuming that the child was not able to take part in her extra-curricular activities, and that, at times, the child's homework would not get completed, putting further stress on the child.

> *"On the negative side, I found it caused her a certain amount of stress. She started to fidget, she started to become very nervous—I found that it tired her. It was quite a lot of work. I just found that the amount of time it took us to complete these toolboxes, took away from any down time for (her). I did cut out any extracurricular activities due to lack of time during the week, for example, girl guides. For example, (her) day is getting home from school at 4 and going to bed at 8. She has homework, she has tutoring, she has piano lessons, she has dinner, she has a bath, and goes to bed at 8 o'clock. So, you can see there's no time for TV, for computers, no down-time at all"—Foster Parent*

Only a couple foster children and foster parents spoke of a negative impact on the foster parent, as a result of delivering the foster tutoring program. Two foster parents talked about how stressful they found the task of trying to find the time during their busy days and weeks to sit down and do the tutoring with their foster child. In each of these cases, the foster parents implied that there were several other children in their homes, with other commitments, and having to try and balance everyone's schedules was quite a stressful undertaking at times.

> *"It was more of the time crunch that was stressful, trying to find enough time to fit it in. At first, there was a bit of a panic about how to fit the time in but that settled down a bit as we went, but it was more stressful for me trying to get everything done."—Foster Parent*

Furthermore, one foster parent admitted that on at least one occasion she lost patience with her foster children when they had become so frustrated and miserable at not getting the answers to

the questions. Two foster children, each from different foster homes (i.e., these children were not siblings and were not the foster children of the aforementioned foster parents), also spoke about their foster parents becoming frustrated while administering the tutoring program, for reasons similar to those given by the aforementioned foster parents.

> *"There was one time that they were so miserable […] that I said 'that's it, I'm not even bothering with you guys'. It turned me off [of the tutoring]."—Foster Parent*

> *"When my mom got frustrated, she told us to leave because she was too frustrated, so that sort of made me and my sister mad but when she was done, she would say how she was sorry for that and we'd say, we'd apologize because when we'd get frustrated, we would get mad as well."—Foster Child*

Perceived impact of the *TYCW* tutoring on the foster child-parent relationship.

Finally, the third theme that emerged from the interviews with regard to the impact of the tutoring program was the effect it had on the foster child-parent relationship. Reflecting the fact that a majority of the foster parents were the ones administering the tutoring program to their foster children, almost all of the participants indicated that there was an additional benefit to the academic and social gains—that the foster parent and child were able to spend one-on-one time together. In addition to being able to spend more time together doing the tutoring, a number of the foster children spoke about feeling as though they got to know their foster parent(s) better, that they came to realize how much their foster parents knew and understood about them, and that their overall relationship had improved.

> *"It made me, it made me understand…how much she knows me."—Foster Child*

> *"I got to like know my foster mom a lot more. Like, she would like help me with the tutoring and, like, spend a lot of time, like, tutoring, like, almost half an hour a day … and we got to know each other and [our relationship]'s been better."—Foster Child*

"Actually, we did it nice…together. We didn't even argue. And we're doing it really pretty good."—Foster Child

The foster children also commented the ways in which they found their foster parents to be helpful and supportive while completing the tutoring together. For example, several children (n = 3) mentioned that although their foster parent would help them learn how to sound out the words, the foster parent, when doing their review, would encourage them to try to sound out the word on their own instead of giving them the answer. Other children (n = 3) stated that they appreciated it when their foster parent would offer them comfort when they got frustrated at not getting an answer or would talk to their teacher in an attempt to get them a little extra help with difficult work.

"We get along better because she encourages me to try all by myself and try to get it right."—Foster Child

"If I was getting frustrated or I just couldn't take it anymore, she'd just comfort me so I'm not, you know, all mad the whole day."—Foster Child

In general, the foster parents' comments reflected perspectives similar to those of the foster children regarding the impact of having done the tutoring together. For the foster parents, there appeared to be an overarching theme of being able to spend more one-on-one time together, time that was reserved and dedicated just for the child. In addition to being able to teach their foster children new reading skills, several of the foster parents (n = 4) stated that they had also had fun with their foster children; while engaged in the tutoring, they would laugh together at the things they read or at silly errors they made, and when the child earned a reward through the reinforcement, they would go to the movies or played board games together at night.

> *"[The tutoring] allowed us to spend more one-on-one time with each other. When she was doing well and I praised her for doing well, she got really excited…doing this together, she saw that I'm dedicated to her"—Foster Parent*

> *"[The tutoring] gave us that time that we were spending together, doing the tutoring. It was something for just me and him—and his time with me. And, um, there's so many kids in the home that we both kind of enjoyed the time, it was the best part. We would do the tutoring and things would come up, like words that I didn't know and (child) would correct me and we'd laugh, or words that we both didn't know, so there were times that it was humorous and it was nice to have that time together. And then the rewards, we got to go to the show twice"—Foster Parent*

Other spillover benefits reported by the foster parents, as a result of having delivered the tutoring to their foster child, included a new found respect for the child's work ethic (as reported by two foster parents), continuation of reading together, better communication, and a closer child-parent relationship. These benefits echo those also reported by the foster children.

> *"I found a new respect for [her]. I found she is a hard worker, she is not a quitter even though certain times she did not feel like working, she did not complain. She sat and did what was required of her. I think she handled it quite maturely."—Foster Parent*

> *"It seems he has fewer problems talking to me when things do come up. It was a good experience. We both enjoyed it."—Foster Parent*

> *"She enjoys to read, she enjoys the, I call it, snuggle time—to sit up on the couch and to read. She likes to read the stories to me and sometimes its vice-versa when I'll read to her"—Foster Parent*

One foster child (of 28) and one foster parent (of 24), from different families, stated that the tutoring had a negative effect on their parent-child relationship. During his interview, the child said that he felt the tutoring negatively affected his relationship with his foster parent when he was not able to give the correct answer, particularly when completing the math portion of the *TYCW* curriculum.

> *"Sometimes she will get mad with, sometimes she will get stressed with me when I can't get an answer right all of the time, like with division."—Foster Child*

As for the foster parent, she reflected that her foster son became so upset and frustrated with the experience of being tutored, particularly when he could not get the correct answers on his first try that his feelings transferred from the tutoring to their relationship. In fact, things became so tense that they had to take a break from the tutoring to try and focus on improving their relationship before reinstating the tutoring lessons a short time later.

> *"[The tutoring] negatively impacted our relationship. He's got a real hate-on for us. There's no other way of putting it, he's never done that to us before, but, we felt maybe we were pushing too hard so we backed off a bit, but it didn't matter. […there were times] when he would throw the book, saying 'not doing it'. One time, he went as far as to rip the book…so right then and there, you might as well close the books because there's no sense in going on because all he's doing is upsetting you and upsetting himself.[…] at one point, we said 'it's just not worth it'…and we had discussions with the CAS and they said 'it's not worth it. He's the one who's going to lose [if you continue the tutoring]"—Foster Parent*

What the experimental group participants liked about the *TYCW* program. Six (of 28) foster children mentioned that there were some aspects of the *TYCW* tutoring program that they either particularly enjoyed or found to be helpful with their learning. For example, a couple of children stated that they particularly enjoyed the activities in the reading workbook because they added an element of fun to the tutoring experience. Other children (n = 2) remarked that they liked the emphasis of learning how to sound out the words, as this helped them not only learn how words were pronounced, but also how to read faster. The foster parents seemed to agree; several foster parents (n = 3) stated that the timed fluency tests (i.e., accurately pronouncing a target number of words per minute) were helpful in ensuring that the child knew their words and helped to increase the children's reading fluency, while also giving the child a goal to work towards in each tutoring session and a marker of their improvement/progress. One

foster parent, in particular, noted that the timed tests helped to keep her foster son focused during the tutoring lessons, despite his tendency towards distraction.

> *"I think it's helpful [sounding out the words] because when I first started doing my lessons, I read very slowly but then I was reading very fast enough. It helped me sound out words better"—Foster Child*

> *"[my foster child] is very distracted, very hyper-active. Generally, he is on medication for that and because the lessons are so quick, quick, quick, he didn't get distracted once; he was able to stay focused completely, through the full lessons, which he's not ever able to do"*
> *—Foster Parent*

One child said that she found it useful having to record definitions of words in the workbook, as she could use the workbook as a reference in the future to help her with her schoolwork. Another child credited the computer-based math program in helping him learn multiplication.

> *"I'll always remember [the definitions] because I have to write them down in the workbook […] so if I have any school work, it can help me"—Foster Child*

Two foster parents also commented that the workbooks removed the power struggle between them and their foster child because they had to follow the instructions in the book. Further, the *TYCW* curriculum provided the foster parents with guidance regarding the children's reading level, removing some of the pressure to find appropriate reading books for the children to practice their skills.

> *"[the program] removed the power struggle between us because we had to follow what the book said and I could show her in the book that this is what we have to do and the way we had to do it"—Foster Parent*

What the experimental group participants disliked about the *TYCW* program.

Despite the positive feedback, both the foster parents and children shared some of the aspects of

the *TYCW* program that they did not like. Assignment of the child to the wrong reading level at the outset of the study was one source of particular frustration for both the foster parents and the foster children. For two foster children, assignment to the wrong level during the initial weeks of the tutoring (i.e., to a level that was too easy) gave them a false sense of confidence in their abilities. When they were reassigned to the proper level and the lessons became much more difficult, they became frustrated. According to one foster parent, the initial error caused significant frustration and upset for the foster child, to the point that he would cry because the words he was learning were "too easy; it was stuff he learned in kindergarten". For other foster children (n = 3), the fluency tests were a source of frustration because of the amount of repetition of words previously learned, combined with the time limits.

> *"...what we're doing is stuff we already learned or already know and then once we've done it, we go on repeating it and then there's not enough time to do it. Then I get frustrated and I have to try it over again and then my time's up and it makes me start all over again and then it makes me do the whole thing all over again!"—Foster Child*

Several foster parents (n = 4) also noted that the timed tests were a source of frustration and disappointment for their foster children. More specifically, according to these foster parents, their foster children did not enjoy having to complete the fluency tests within a specific amount of time because it put too much pressure on the children and, if they did not accomplish their goal, the children would get mad or feel disappointed with themselves. These foster parents also implied that, over time, the timed tests were no longer a source of encouragement but a source of negativity for their foster children.

Finally, three foster parents commented that the reinforcement aspect of the *TYCW* tutoring program did not work to motivate their foster children, but rather backfired. That is, once the children received their reward, he/she either did not want to do any more work or

refused to cooperate for the rest of the tutoring session, making it difficult for the foster parent to complete the target number of tutoring sessions per week.

> *"…rewarding does not work with [my child] because once he's got his reward, he figures 'I've got my reward and now I don't have to do anything more'"—Foster Parent*

Difficulties the experimental group foster parents encountered with the *TYCW* tutoring program. A number of foster parents also spoke about the training they received prior to delivering the tutoring curriculum as well as their actual experience administering the tutoring program. That is, several foster parents (n = 5) said they would have liked to have had more training in the *TYCW* curriculum—that the one day, 6-hour training was not sufficient to help them mater all of the components of the *TYCW* tutoring program. There was consensus among these foster parents that they would have preferred to have had less focus on the author's history, background and research, and a greater emphasis placed on learning how to properly implement the program, including the positive reinforcement and behaviour management components. Furthermore, a few of the foster parents (n = 3) expressed that they felt extremely frustrated when they tried to call the author's office for support, but did not receive a return phone call for over a week.

> *"There were times when I would try to call Michael and he wouldn't even get back to me for over a week and I was thinking, "this is insane!"….I was just hoping that I was applying [the tutoring curriculum] the right way"—Foster Parent*

Some foster parents encountered errors (i.e., typos and page numbering errors) within the *TYCW* tutoring books, which caused confusion and concern that they had misunderstood something or were not administering the tutoring program correctly. Furthermore, one foster parent said that she was unable to support her foster son with any difficulties he encountered

while he completed the self-directed, computer-based mathematical component of the program because she and her husband and are both computer illiterate.

Additional information. A few foster parents (*n* = 7) provided some additional comments that did not fit into the other themes, but that are still worth noting, including suggestions for future studies/tutoring initiatives and general impressions regarding the overall effects of the tutoring program. A couple of foster parents said that their foster children's teachers had not been very supportive of the child's participation in the tutoring trial and did not cut back on the amount of homework assigned to the child and, at times, would make comments to the child about uncompleted homework. The foster parents indicated that in situations like these, the child responded with increased stress and concern about not getting their work done. As a result, these foster parents suggested that perhaps, in future tutoring trials, greater attempts be made to engage the teacher to provide support to the child. Other foster parents (*n* = 2) suggested that if there had been a location outside of the home where they could have taken their children to complete the tutoring, there might have been higher levels of cooperation and motivation on the child's part. Meanwhile, one foster parent suggested that she expected that if the tutoring program had been administered by a third party (e.g., professional tutor or volunteer), her children would have had more success with the program.

> *"I think it would have been more successful had it been done maybe by professionals in a proper sort of setting for it. Because even though it was in my own home, and I have a fairly large home, and even though we were in a separate room, you know, shy of posting a security guard outside the door, I mean, it's hard to get that, you know, one-on-one in a large family home."—Foster Parent*

> *"If you were to do this program again and you modify it again so that there's a place for me to take those kids, I can guarantee you [better success] because for me it's a little more controlled that I put them in the car and take them there. Whereas when we're at home and they're saying "oh, just 5 more minutes of my movie" you know, then I'm on a time constraint."—Foster Parent*

With regard to general impressions, it appeared that, overall, the comments made by both the foster children and foster parents suggested that they felt as though the *TYCW* tutoring program was a positive experience and endeavour, and that it would be worthwhile doing the tutoring trial again with other children in the future.

> *"It changed my life! It's given me a better brain or something because I'm not as clumsy as when I was always watching TV before as much and all that and like, […] when I get to school now, all I want to do math and read […]it changed my life (giggles)"—Foster Child*

> *"It works! I've seen a big, big change. Big progress. Like I said, yesterday, she just grabbed a big bottle and pretended that she was in a commercial and was reading the instructions on it with no problem. Sometimes, they'll have a big word and she'll have difficulty saying the word and I'll say "use your tutoring, sound it out" and she will, she'll sound it out in bits and pieces and then she'll put it all together and say 'ohh!'."*
>
> *—Foster Parent*

> *"I am learning and understanding more what I'm doing. It really makes me understand more when it sinks in and I can understand and speak clearly as well."—Foster Child*

> *"To me, it's worth doing. I've seen some changes in her schoolwork, she's coming home with better marks and she's excited when she comes home from school with good papers. Spelling and math have improved."—Foster Parent*

> *"Doing [the tutoring] with children who have some difficulties, it's a little bit harder but I think the program is still worth it."—Foster Parent*

DISCUSSION

The primary purposes of the current exploratory study were as follows: (a) to investigate the role of gender as a moderator of the effects of a foster parent-delivered direct-instruction tutoring program on foster children's basic reading and math academic skills; (b) to examine the effects of the academic tutoring program on the foster children's mental health and on their relationship with their foster parent-tutors; (c) to explore several other effects, including: the moderating role of implementation fidelity on gains in reading and math; and the moderator effects of mental health on gains in reading and math; and the direct effect of gains in reading and math skills on mental health. A secondary purpose of the study—which will begin this discussion of findings—was (d) to compare the results of the effectiveness of the tutoring intervention when assessed (as herein) via repeated measures analysis of variance (RMANOVA) rather than (as in Flynn et al., 2012) regression-based analysis of covariance (ANCOVA).

Overall, the results of the current study are encouraging, replicating and echoing findings also reported by Harper (2012), Olisa (n.d., as cited by Forsman & Vinnerljung, 2012) and Osborne et al. (2010), while also contributing to a growing body of international literature evaluating (tutoring) interventions aimed at improving foster children's basic skills in reading and math through targeted and structured intervention (Forsman & Vinnerljung, 2012). Additionally, preliminary gender differences were found and noted, both among the academic and mental health/social development results, with a trend toward the foster girls appearing to benefit more from the tutoring through greater improvements in their basic academic skills, while the boys demonstrated slightly improved mental health and parent-child relationship benefits. For the sake of clarity and with the risk of some repitition the results will briefly be reviewed within each section to help facilitate the discussion of implications. Due to exploratory

nature of the analyses, and especially the low power stemming from the small number of children in the condition-by-gender groups, emphasis will be placed on the size of the effects rather than on the statistical significance.

The Effects of the *TYCW* Tutoring Intervention on WRAT4 Outcomes in the Sample as a Whole: RMANOVA versus ANCOVA

The current study is the second study based on the *RESPs for Kids in Care* project that represents one of two randomized control trials that have recently found some support for the effectiveness of the *Teach Your Children Well* tutoring program with foster children when delivered a one-to-one basis (i.e., Flynn et al., 2012) and in a small group format (i.e., Harper, 2012; Harper & Schmidt, 2012). The results of the current study confirmed Hypothesis 1—that the foster children in the experimental group benefitted from receiving the *Teach Your Children Well* tutoring curriculum, as indicated by their statistically significant gains on four of the five WRAT4 subtests. These findings are not only consistent with the major hypothesis of the first study of the same project, conducted by Flynn et al. (2012), but also add to the very small yet growing body of literature that is establishing foster parent-delivered tutoring as a viable method of intervening to improve foster children's basic skills in reading and math (Forsman & Vinnerljung, 2012).

Indeed, the results of the *RESPs for Kids in Care* project, which includes the current study and that conducted by Flynn et al. (2012), are relatively consistent with the findings reported by Harper (2012)—that the *TYCW* tutoring program produced positive outcomes for foster children in the experimental group. When the results of the current study are contrasted to those presented by Flynn et al. and Harper (see pages 39 through 44 for a recall of the details), one can see that the two latter studies each found fewer but stronger overall findings (i.e., *p*-

values) and stronger effect sizes than those reported herein (see Table 2). However, given the new report published by Lipsey et al. (2012), the current effect size results likely reflect potentially important and meaningful results across all subtests, although replication is necessary before any further conclusions can be made.

Although the results across all three of these studies, which investigated the impact of the *TYCW* tutoring intervention, were within the same ballpark, the few differences in findings may be due to several factors that have also been documented to some degree by both Flynn et al. (2012) and Harper (2012). First, each of the three studies utilized different statistical analyses, which, as previously discussed, answered similar but slightly different questions, and thus elicited similar but somewhat different results.

Second, the two studies from *RESPs for Kids in Care* project [i.e., the study herein and that by Flynn and colleagues (2012)] utilized a one-to-one tutoring format whereas Harper (2012) implemented a small-group format. Although the literature suggests that tutoring within the context of small groups is relatively equivalent to individual tutoring (Slavin et al., 2011) and often more cost-efficient in delivery (e.g., Acalin, 1995), there may be contextual factors exerting differential influence on the foster children's participation that could account for some of the observed differences. For example, the university volunteer tutors who delivered the *TYCW* curriculum in Harper's study received two days of training, as opposed to the one day of training received by the foster parents in the *RESPs for Kids in Care* project. This additional training could possibly have resulted in a better understanding of what was required of the tutors, including greater mastery of skills or clearer understanding of how to implement the rewards system and behaviour management components of the program. The two projects also involved different types of tutors (i.e., foster parents versus volunteer university students), which could

have implications, including, but not limited to, the level of literacy of tutors (i.e., perhaps the volunteer university students had a higher level of education and, thus, had stronger literacy skills than the foster parents) and motivation (i.e., it is conceivable that the foster parents were more invested in spending the time doing the tutoring with their foster child, whom they are raising within their home and have likely developed an attachment-based relationship through their daily interactions, as compared to the volunteer student tutors). However, given the infancy of this research, it is premature to draw any conclusions of the impact of these factors on the success of the tutoring program on the foster children's academic outcomes.

Third, there were a few differences in the way in which the current study, within the *RESPs for Kids in Care* project, and that conducted by Harper (2012) implemented certain aspects of the reading and mathematics components of the *TYCW* tutoring curriculum. For example, Harper's participants reported significant problems with computer-based mathematical portion of the curriculum, and did not complete the 30 minutes of interactive reading that was required of the experimental group participants in the *RESPs for Kids in Care* project. Although purely speculative, it is possible that Harper did not require her participants to do the 30 minutes of interactive reading because this element of the curriculum would have been much more difficult to reliably implement with volunteer university student tutors, who may not have been available in addition to the time they had already committed.

Fourth, it should be noted that Harper's (2012) two-year study had a larger sample size (N = 101) than the one-year *RESPs for Kids in Care* project (N = 64; under which the current study and that by Flynn et al. (2012) were conducted). There were also noteworthy differences between these two samples of participants. For example, in addition to using different selection criteria and randomization techniques, 80% of the foster children in Harper's study were of

Aboriginal heritage, which, according to research, suggests that these children were at higher risk for having experienced more aversive early life (and in care) experiences (see Filbert, 2012 for a review), including less exposure to good education and educational supports. Alternatively, cultural experiences unique to being raised within an Aboriginal community may also have played a role that is currently unknown. Furthermore it appears as though the participants in Harper's study started with mean scores that were approximately two-thirds of a standard deviation below the mean scores of the foster children in the *RESPs for Kids in Care* project. Thus, as compared to the latter group of foster children, the gains that this former group of children made may be reflecting greater advances in lower-order (versus higher-order) literacy skills. However, this is only speculation, but is used as an example to help emphasize the need for more studies to replicate these findings in order to draw any form of solid conclusion.

Gender as a Moderator of the Reading and Math Effects of the Tutoring Intervention

The current study appears to be the first to have examined the role of gender in accounting for the effects of tutoring, in either the general or in the in-care population. Although Ritter et al. (2009) mentioned gender twice in their systematic review and meta-analysis of the effects of tutoring amongst children in the general population, no results were actually reported, suggesting that gender has not (or has rarely) been explored. This also holds true for the child welfare literature; very few accounts were reported within the context of the independent search conducted for the purposes of this study or within the efforts of other authors who have synthesized the literature (e.g., Trout et al., 2003). The effect of gender is an important angle to explore because it is believed that boys and girls perform somewhat differently academically (Hinshaw 1992; Trout et al., 2003). Given the exploratory nature of these findings and the lack of empirical literature to link the results to, the discussion of these results within the context of

past research is rather limited. As noted earlier, because of the small sample size, the associated problem of low statistical power, and the exploratory nature of the present study, the results relied mainly on *t*-tests rather than on the two-way (group-by-gender) or three-way (group-by-gender-by-time) interactions in the multivariate analyses to investigate gender effects.

The results of the current study provided some insight into Working Hypothesis 1, which anticipated that the foster girls in the experimental group would make greater gains in their reading and mathematical skills, as compared to the foster boys, at post-test. As was reported on pages 102 through 112, and consistent with the hypothesis, the girls in the experimental group made statistically significant gains on four of the five WRAT4 subtests between the pre- and post-tests, while the foster boys in the experimental group made similar gains on three of the five subtests, after having received the foster parent-delivered tutoring program. More specifically, the girls in the experimental group appeared to have had a moderate-to-large advantage over the boys on two of the basic-skills areas assessed (i.e., on Word Reading and Math Computation), whereas the boys demonstrated a large advantage over the girls on their Sentence Comprehension skills.

Taking a closer look at the results, in an attempt to better understand the differential effects, it is interesting to note that the girls in the experimental group started off with lower mean scores on four of the five WRAT4 subtests (i.e., the exception was on Math Computation) than did all of the other foster children, including the girls in the control group—this is in spite of the fact that there were nonsignificant differences between the groups at pre-test. However, the pretest scores of the foster girls in the experimental group were approximately 8-points below the mean scores of the boys on the reading and spelling subtests—a difference that was more-or-less maintained at the post-test. The effect sizes also revealed stronger differential gains on four of

the five WRAT4 subtests between the girls in the experimental group and the control group, as compared to the boys in the experimental and control groups, who made gains at a rate that were relatively similar to each other on three of the subtests. Based upon these observations, it is very possible to speculate that the foster girls were performing academically in a counter-stereotypical manner, which might have led to their nomination in the *RESPs for Kids in Care* project by their workers. If this is indeed the case, then it is likely that the girls were 'needier' academically than were the boys, who, in contrast were performing quite academically well overall (and thus also in a somewhat counter-stereotypical fashion).

Although the boys and girls in the experimental group did make significant and substantial gains in some areas of basic academic skills, as a result of having received the tutoring intervention, there are other areas that did not change significantly (i.e., Word Reading for boys and Spelling for both the foster boys and girls). One could speculate that the lack of improvement in these two areas could be due to differential learning needs of boys versus girls. In the case of Spelling, it could be that the *TYCW* tutoring program did not specifically focus on helping the foster children develop these skills. However, recalling the results of Harper's (2012) study, significant effects for spelling were noted and thus provides a challenge to this argument. Moreover, when subsequent analyses were conducted to determine the level of association between the different domains of academic skills assessed by the WRAT4 (results that are presented in Appendix N), there are moderate correlations (i.e., $r \geq .422$) between all five of the subtests, suggesting that if one area of academic skills is going to be boosted from tutoring, the other skill areas will also likely benefit. The relative smallness of the sample and particularly of the gender-by-condition groups makes it difficult to speculate what to do to help boost the areas of academic skills that did not demonstrate significant changes.

Taken together, the various quantitative-based results associated with Working Hypothesis 1 provide additional evidence supporting previous research findings that there is a positive effect of tutoring on foster children's basic academic skills. There was also some evidence to suggest differential gender effects, with the foster girls in the experimental group benefitting more from the *TYCW* tutoring intervention than did the foster boys in the experimental group. The qualitative results add to and strengthen the support for these findings because not only did a majority of the foster children in the experimental group report that they perceived a positive change, but there was also a slight tendency for the girls (versus the boys) to endorse a positive impact of the tutoring on their ability to do reading and math homework. Collectively, the qualitative and quantitative results indicate that improvements can be made, although some areas of the foster children's academic functioning were left "untouched" by the tutoring. More studies that are larger in scale and provide longer-term interventions are needed before there can be any speculation about what can be done differently, provided more of, or in addition to already developed programs, such as *TYCW*.

The Effects of Academic Tutoring on Foster Children's Mental Health and Relationship with their Foster Parent-Tutors

Based upon the literature, several working hypotheses were formulated regarding the impact of the *TYCW* tutoring curriculum on the experimental group's mental health and self-perception. Although the sample sizes within the current study were too small to directly investigate gender-by-level of mental health effects from a quantitative perspective, an effort was put forth to look at the relation between gender and academic skills, and mental health and academic skills to at least begin documenting trends within a child welfare context.

Contrary to expectations stated in Working Hypothesis 2, the experimental group's mean ADHD Index T-score did not change significantly between the pre-test and post-test assessments and there was no differential effect of having received the tutoring on the experimental group foster children's ADHD symptomatology as a result of having received the tutoring, as compared to those children in the control group. However, it is interesting to note that the boys in the experimental group demonstrated a very slight decrease in their mean ADHD Index T-scores between the pre-test and the post-test—a decrease that took their scores from the 'mildly atypical' range, denoting 'possible, significant' ADHD problems, to the 'slightly atypical' range, which suggests there are 'some' ADHD-related concerns (Conners, 2001). The girls in the experimental group experienced a slight increase in their scores from pre-test to post-test; that is, their mean ADHD Index T-score went from the middle of the 'moderately atypical' range to its upper-end, which, nonetheless, suggests there are 'significant' ADHD-related problems (Conners, 2001). It is possible that, because the CADS-P is a parent-report measure, the foster parents in the experimental group perceived their foster girls as having 'developed' or displayed more ADHD-like symptoms after having delivered the tutoring to their foster children over the course of the intervention year, while the foster boys were perceived as having demonstrated improved attention and hyperactivity-type behaviour. Alternatively, it is conceivable that over the course of the year, the girls truly did begin to display more ADHD-related symptoms. In the end, the reasons behind this slight discrepancy a currently unknown but would be worthwhile to investigate in future studies to determine if there is a consistency in findings and to better understand the reason(s) for such a difference.

Second, Working Hypothesis 3 proposed that the foster children in the experimental group would show a greater mean pre-test-to-post-test decrease in internalizing and externalizing

behaviour, as compared with the foster children in the control group. The results offered only very limited support for this hypothesis; as compared to the boys, the girls demonstrated near-moderate and substantive changes in their externalizing scores (d = 0.25, 95% CIs [-0.6, 0.1]). Contrary to expectations, the substantively important difference in the foster girls' externalizing scores appeared to be due primarily to the 2-point increase in the control group girls' pre-test-to-post-test mean score (a change that placed their scores from the high-end of the borderline range to the low-end of the clinical range) rather than the 1-point decrease in the experimental group's pre-to-post-test mean score (which represented a change from being at the low-end of the borderline range into the high-end of the normal range). In contrast to the girls, the mean T-scores of the boys in the experimental group went from the low-end of the clinical range to the high-end of the normal range, while the scores for the boys in the control group remained in the clinical range (indicating they had a high-level of problems, as perceived and reported by their foster parents) between the two assessment periods.

In contrast to the externalizing subscale results, on the internalizing subscale, all of the boys' and girls' mean T-scores, regardless of being in the experimental or control group, were within the normal range at the pre-test assessment and remained in this range with little variability by post-test. These latter findings suggest a floor-effect; that the foster children were doing well enough that there was little to no room for them to improve above and beyond their current level of functioning. However, internalizing problems are, by nature, internal and thus, relying solely on foster parents' reports to evaluate the degree to which a foster child is experiencing such difficulties may not have been the most methodologically relevant approach.

The aforementioned observations from the CADS-P (Conners, 2001) and CBCL (Achenbach & Rescoria, 2001) mean scores provide some further insight into the level of

difficulties that the foster children were experiencing. Indeed, there are consistencies between these latter findings and the qualitative responses of the foster parents in which they indicated that their children exhibited rather high levels of observable behaviour problems (i.e., externalizing and ADHD-related symptomatology). In fact, according to the foster parents, one of the biggest barriers to their delivery of the tutoring program was their foster children's behaviour problems. It is possible that the measures selected for use in the current study were not sensitive enough to quantitatively detect the changes in scores that reflect meaningful 'real-life' improvements within the domains of the foster children's mental health difficulties assessed. This notion receives support from the qualitative findings in which several foster parents commented they observed a positive change in their foster children's behaviour and emotional well-being after having received the academic tutoring program. Of interest, there was a slight tendency for the foster parents to report a perceived marginal improvement in mental health difficulties amongst the foster boys, versus the girls. These positive gains were reported even in light of the two foster parents who said that the tutoring program exacerbated their foster children's pre-existing mental health difficulties.

In general, the limited significant quantitative results associated with Working Hypothesis 2 and 3 appear to be rather consistent with those documented by Harper (2012) and Tideman et al. (2011) in which there was very little gain in the foster children's mental health after having received tutoring or an individualized academic plan, respectively. However, the support for the two Working Hypotheses is strengthened when the qualitative results of the current thesis are taken into consideration in conjunction with the observations noted regarding the quantitative scores from the two mental health measures; that is, there is some evidence of improvements in the experimental group's mental health between the pre- and post-test

assessments. Generalizability of these results is quite limited and no firm conclusions can be made until further studies are conducted, considering the exploratory nature of these results and that this is a relatively unexplored area of research. Future studies should continue to investigate the 'spillover effects' of tutoring on foster children's mental health with larger sample sizes, different measures (that might not only be more sensitive in detecting even slight changes in children's mental health scores), while using a mixed-method research approach, in an effort to determine if there is any evidence to suggest that mental health (ADHD, internalizing and externalizing difficulties) decreases with improvements in basic academic skills.

Turning now to the impact of the tutoring on the foster children's self-perception, Working Hypothesis 5 proposed that the foster children in the experimental group would report a more favourable academic self-perception at the post-test, as compared with the foster children in the control group. This hypothesis was formulated based upon the notion, and the limited previous research, that direct amelioration of academic skills may also positively impact children's self-perception and confidence (Hinshaw, 1999; Tideman et al., 2011). The current results only partially supported this working hypothesis; although the boys and girls in the experimental group did have higher means on the SPPC than their control group counterparts, the differences were not statistically significant. However, the effect sizes revealed substantively important (WWC, 2008) and moderate-to-large (Lipsey et al., 2012) differences in the favour of the experimental group, suggesting that the foster boys and girls in this group had more favourable academic-based self-perceptions after having received the tutoring intervention than those children in the control group.

Although it is tempting to attribute these favourable findings to the effects of the tutoring intervention alone, such speculation needs to be made with caution because, as was reported by

Kinard (2001), it is possible that the experimental group foster children were inflating their view of self rather than accurately reporting a more favourable self-perception. However, this explanation is called into question when the qualitative responses of the foster children are recalled—a few of the respondents indicated having a more positive sense of self after having completed the tutoring program. The foster parents' responses seemed to corroborate the foster children's reports, as they also mentioned observing some positive changes in their children's confidence levels, and, in some cases, said that even the children's teachers had commented on positive changes. These perspectives are consistent with previous literature, which noted that several benefits of parental involvement in education include fostering positive self-perception (Hawkins et al., 1999; Smokowski, 1998), higher motivation, and greater self-competence (Weiss et al., 2009). Although the potential remains that the foster children have an 'inflated' view of self, it seems just as likely that they actually did feel better about themselves as their basic academic skills improved and they began to notice positive gains in their school work and relationships with others (i.e., friends, parents, teachers). In order to more fully understand whether improvement in basic academic skills does improve children's academic self-perception, further research is warranted and should involve a pre-test and post-test assessment.

With regard to the impact of the *TYCW* tutoring on foster child-parent relationship, the results provided partial support of Working Hypotheses 5 and 6, that both the foster children *and* foster parents in the experimental group would report a closer relationship, at the post-test, as compared to the foster children and foster parents in the wait-list control group. Indeed, the only support for the two Working Hypotheses came from the qualitative results as the quantitative results were either nonsignificant or significant in the opposite direction of the stated hypotheses. More specifically, recalling the qualitative findings, a majority of the foster children and their

foster parents spoke about the positive experiences they had with the foster parent-delivered tutoring program, with many of them reporting an improved parent-child relationship. There was also a slight tendency for the boys to report a marginally more positive impact of the tutoring on their relationship with their foster parent(s) than did the foster girls. Positive changes in the foster parent-child relationship appeared to have been elicited through spending one-on-one time together that they otherwise would not have had and having fun while doing the tutoring seemed to translate into better general communication and understanding of each other, greater trust and an increased tendency for the foster child to turn to the foster parent for support as indicators. These themes are strikingly consistent with the previous research reviewed. For example, the literature has indicated that the benefits of a parents' involvement in their children's academics include enhanced communication and improvement in the overall parent-child relationship (Hawkins et al., 1999; Smokowski, 1998). When the relationship improves, there are greater opportunities for trust, emotional support, and open communication with the children to develop—features that have all been associated with positive behaviour, self-perception, academic expectations and achievement (Weiss et al., 2009).

In contrast to the aforementioned qualitative results, the quantitative findings showed nonstatistically significant differences in the foster boys' or girls' mean scores on the APQ Positive Parenting or Parental Involvement subscales, at post-test, as compared to the foster children in the control group. Although the effect sizes for the foster children's perception of their foster parents' involvement were quite large (Lipsey et al., 2012), the magnitude of the difference between the effect sizes for the two groups was not enough to suggest that there was a differential impact for either the experimental or control group children. As for the foster parents' perception, significant effects were noted in the *opposite* direction of the stated

hypothesis; the foster parents of the boys and girls in experimental group, who administered the tutoring program to their foster sons, had a significantly *less* favourable view of their positive parenting skills and their level of involvement in their foster children's lives, than did the foster parents of the boys in the control group. The effect sizes also indicated that the latter group of foster parents had a differential advantage than the former group of foster parents (i.e., those in the experimental group).

These quantitative findings were also in contrast to the literature that suggests there is often a positive impact on the overall parent-child relationship when parents are involved in their children's academics (Hawkins et al., 1999; Smokowski, 1998). A tentative explanation for these results could be that the foster children and parents in the experimental group felt as though doing the tutoring together created tension or negativity within their parent-child relationship. This suggestion is based, in part, by some of the qualitative responses provided by some of the foster children and foster parents, who indicated that some of the pressures associated with the tutoring experience brought stress, frustration, and conflict to the parent-child relationship.

Alternatively, there may have been some unknown impact of having a foster parent, who is by nature a nonbiological parent, delivering the tutoring program with the foster children; there could be differences in the level of motivation, investment in the child and their future, feelings towards the child (i.e., perhaps more easily frustrated with behavioural difficulties or resistance to the tutoring) that may not have been detected or reported within the previously conducted general population-based studies and literature. Other factors, including, but not limited to, the length of the child's placement with the foster family at the time the tutoring intervention was provided, quality of the foster parent-child attachment, or the level and number of behavioural (or learning) difficulties the child experienced could also have impacted the

perceptions of the foster parents and children. Due to the fact that no previous research has investigated the effects of a foster parent-delivered tutoring on the foster parent-child relationship, the generalizability of the findings are limited and the tentative explanations proposed are only speculative. Given the discrepancy between the qualitative and quantitative findings, it would be worthwhile for future projects to investigate the impact of foster parent involvement in foster children's academics and its impact on their relationship. The use of a qualitative assessment component could be complementary to quantitative investigations in order to better understand and appreciate the effects of an academic tutoring program on the parent-child relationship that might not otherwise be detected through quantitative analyses alone. Further investigation into differential gender effects is also warranted given that the qualitative findings of the current study alluded to a slightly more favourable perceived improvement in the parent-child relationship amongst the foster boys, as opposed to the foster girls, as a result of having received the academic tutoring intervention. With boys representing a slight majority of all foster children, this latter finding may be particularly noteworthy if it were replicated, as it may emphasize a greater need of a positive relationship and providing an additional means of promoting resiliency amongst these at-risk children.

When taken all together, the mental health-related findings of the current study provided only partial support for the 'spillover' effects of the tutoring program, and only partially replicated previous findings reported by Ayllon and colleagues (1975), and Coie and Krehbiel (1984), who both found a positive association between academic outcomes, mental health and social development, when general-population children were provided an academic intervention (although not tutoring). As already mentioned, within the child welfare context, the current results also partially replicate those reported by Tideman et al. (2011) and Harper (2012) who

both found very little impact of their interventions on foster children's mental health. However, of important note, to our knowledge, only two projects [i.e., the *RESPs for Kids in Care* (i.e., the current study and that by Flynn et al. (2012)) and that by Harper (2012)] have provided tutoring as the academic intervention with foster children. Therefore, it is possible that, as discussed, foster children exhibit more (or different) mental health difficulties than those general-population children who participated in previous studies, while the nature of the academic intervention may have produced differential results. If this suggestion were true, perhaps there might be a lag in the amount of time it takes (i.e., a 'sleeper effect' that could be weeks or months in duration) for the benefits of a tutoring program to 'spillover' and generate positive effects on children's mental health and self-perception.

However, it is important not to place full emphasis on the lack of statistically significant findings alone, as the qualitative results provided support for all of the hypothesized spill-over effects, with the exception of improvements in the foster children's internalizing difficulties. Indeed, the qualitative results brought attention to the very meaningful changes that the foster parents and foster children reported, including: positive improvements in the foster children's externalizing behaviour, level inattention and distractibility, self-perception and confidence, and foster parent-child relationship. When these findings are taken into consideration, along with the claims that the some of the children's teachers were also commenting on positive changes in the classroom, there appears to be evidence showing spillover effects with positive gains being generalized to other areas of the child's life (i.e., beyond changes in the home). This provides a basis upon which to speculate that academic tutoring can help to break the negative cycle of foster children's academic and social failures.

'Other' Effects

The impact of tutoring more than one child. The findings of these analyses, associated with exploratory research question 1, were unexpected, as it was revealed that there appeared to be a burden of tutoring more than one foster child (i.e., children who were recruited as a sibling pair), as compared to those foster children who were recruited on their own. Additionally, the effect sizes demonstrated a modest-to-considerable advantage (i.e., $d \geq 0.22$) for those children who received the tutoring as a singleton versus as part of a sibling pair on three of the five WRAT4 subtests. There are several potential explanations for these findings. First, perhaps the foster parents who agreed to tutor two foster children had difficulties delivering the curriculum with the same quality as those who only had to tutor one child; that is, as compared to the latter group of foster parents who were asked to tutor their foster child for 3 hours per week, those in the former group would have had to provide a total of 6 hours of tutoring (i.e., 3 hours per child). This proposition is based upon the fact that, in their responses on both the questionnaire and the qualitative questions, several foster parents commented on the difficulties of trying to balance the time required to deliver the tutoring with other commitments, such as the foster children's extracurricular activities.

A second possibility is that, despite the research team's request and direction to foster parents of siblings to tutor each child individually, some of these foster parents may have tutored the sibling children together. If this did occur, there is a chance that the children did not benefit as much from the tutoring than if they received the intervention on a true one-on-one basis.

A third and important consideration is rooted in the mean scores of the two groups of foster children at the pre-test assessment; a closer look at the mean scores show that the foster children who were recruited as a sibling pair had higher scores on all of the WRAT4 subtests at

pre-test, with the difference in scores ranging from an 8-point higher mean score on Math Computation to a 12-point higher mean score on Reading Composite. That is, there may have been a ceiling effect amongst the foster children recruited as a sibling pair when they received the tutoring, meaning that they were already performing quite well academically and, therefore, did not have as much room for improvement as those foster children who were recruited as an individual. Due to the exploratory nature of these analyses and, upon revision of the tutoring literature in which there appears to be no previous studies investigating the impact of tutoring more than one child, the generalizability of these findings are very limited. However, this could be an important aspect of the experience of tutoring to investigate in future studies in order to determine if there is indeed a burden on the person delivering the curriculum.

Moderating role of implementation fidelity on gains in reading and math. The results of the implementation fidelity analyses revealed that, amongst the experimental group participants, the foster children who received higher levels of implementation of the reading and math curriculum achieved statistically significant gains across all five of the WRAT4 subtests. There was also evidence of a moderation effect by level of implementation, which provides further insight into exploratory research question 2. More specifically, foster children who received higher levels (versus lower levels) of the tutoring curriculum in reading and math had an advantage on the WRAT4 Math Computation subtest. There was also a *very* slight hint of an advantage on the Word Reading subtest with the receipt of higher levels of the reading curriculum. In general, the implementation fidelity results suggest that, for the majority, the *TYCW* program was delivered with an adequate level of implementation, as demonstrated by the better outcomes for the foster children in the experimental group who received higher, rather than lower, levels of implementation.

Given the above-results, it is interesting that the dose-response analyses (exploratory research question 6) yielded primarily nonsignificant results, with the exception of Math Computation, a subtest for which the number of lessons the foster children received, when combined with their level of cooperation (exploratory research question 7), yielded significant changes. It could be that the foster children may have benefitted more from the tutoring intervention when they received a higher level of implementation fidelity, which, for some reason, gave them a particular advantage in improving their math computation skills. However, this proposition is only tentative, considering the exploratory nature of these results and the lack of previous literature addressing the impact of implementation on children's outcomes.

Moderator effects of mental health on gains in reading and math. As previously mentioned, the moderating effects of mental health (i.e., exploratory research questions 3 and 4) were examined only at the group-by-mental health level because, when the group-by-gender-by-mental health analyses were attempted, the subgroup sizes were so small (i.e., $n = 2$ and $n = 4$ in some cases) that it was too difficult to draw any conclusions. As presented on pages 136 through 143, the experimental group children who had higher *and* lower mean pre-test scores on the ADHD Index and Total Problems scales made statistically significant gains on three of the five WRAT4 subtests, respectively. These results also suggest there was a moderating effect of mental health on the foster children's academic outcomes; foster children who had lower levels of pre-test ADHD and Total Problems each demonstrated a differential advantage on Sentence Comprehension. However, on the Math Computation subtest, opposite effects were noted—foster children with *higher* levels of pre-test ADHD demonstrated an advantage over those with lower levels, while foster children with *lower* levels of pre-test Total problems also showed an advantage over their peers with higher levels. Finally, on Spelling, the foster children who had

higher levels of ADHD and Total Problems demonstrated a slight advantage over the foster children who demonstrated lower levels of the same difficulties, respectively. These results suggest that foster children who present with lower levels of Total Problems (emotional and behavioural) and higher levels of ADHD might benefit the most from the DI-based *TYCW* tutoring curriculum.

These moderation-based results are not only consistent with the general population literature, in which ADHD symptoms and emotional and behavioural problems have been associated with academic achievement (i.e., difficulties in reading and arithmetic; Hinshaw, 1992; Biederman, Faraone, & Milberger, 1996), but also reinforce Harper's findings that demonstrated foster children who experience mental health-related difficulties can and do benefit from an academic intervention.

One tentative explanation for these aforementioned findings is that the *TYCW* program is based upon DI-theory, which uses scripted plans that are highly interactive and incorporate a behavioural management component (Dolezal, 2007; Ryder et al., 2006). With these features, it is conceivable that the foster children in the experimental group were able to learn how to cope with and manage their own behaviour and emotions for the periods of time in which their foster parents delivered the tutoring intervention. If it is the case that the foster children learned self-management behaviour, perhaps the reinforcement and behaviour management components of the DI-based program helped promote, within these children, a gradation from external rewards as a motivator for good behaviour and concentration to the adoption of an internal model of effort and perseverance, which could also be integrated into other spheres of the child's life, including classroom behaviour. This proposition is consistent with the qualitative account of one foster parent who reported that components of the tutoring curriculum helped her foster son

focus on the lessons, despite his tendency to become easily distracted, and the claims of other foster parents that their foster children's teachers also noted positive changes in the child's behaviour in the classroom.

The aforementioned promising results reported herein and by Harper (2012) may also attributable to the SAFE (Durlak & Weissberg, 2007) characteristics described in the literature review section of this paper—that the *TYCW* tutoring curriculum was sequenced, active, focused, and explicit such that it caught and maintained the foster children's attention and interest long enough for them to learn the basic reading and math skills necessary to help them achieve. For example, the timed fluency component of the curriculum was reported by several foster parents to be a motivator for their foster children in that they were able to set and achieve goals, while also helping them to track their progress. As they noticed gains, perhaps the foster children began to feel better about themselves and subsequently wanted to engage more in the tutoring program. This proposition is consistent with the results reported by Bereiter and Kurland (1981-1982) with regard to the Follow-Through project in which positive effects on the participating children's self-esteem were noted after receiving a DI-based tutoring intervention. Alternatively, with the foster children's reading level and mathematical-abilities made more explicitly clear through the initial assessment, perhaps their levels of inattention improved because they were engaging with materials that were a more appropriate level for their skills. Either way, it is important to keep in mind that with the scarcity of research in this area, these explanations are only tentative and more research needs to be conducted to understand the different levels of impact an academic tutoring intervention can have on different areas of functioning within a foster child.

Moderator effects of gains in reading and math skills on mental health. Additional analyses were conducted on a purely exploratory basis to establish whether the experimental group foster children's WRAT4 gain scores mediated their mental health outcomes (exploratory research question 5). The hope was that the results would also help to provide further support for the reciprocal side of Slade & Wissow's (2007) model (i.e., pathway d), such that gains in academic skills would have a positive impact the foster children's mental health. The results of these analyses indicated that, amongst the experimental group foster children, academic gains in Math Computation were associated with gains in mental health (i.e., the children's ADHD and Total Problems mean scores)—results that were also supported by the qualitative findings. Although it was expected that the reading subtests of the WRAT4 would also mediate the experimental group's mental health outcomes, the results were statistically nonsignificant. Thus, these quantitative results offer partial support for the notion that gains in basic academic skills mediate mental health outcomes and begin to build on the scarce literature that has already investigated this association within the context of general and child welfare populations. Although gender-specific analysis could not be conducted, due to small sample sizes, these results provide direction for future research with a larger number of participants.

Further support for the exploratory research question can be drawn from the qualitative results, which helped to elucidate important findings that otherwise would have been dismissed based upon the statistically nonsignificant quantitative results alone and, thus, help substantiate the partial support of this exploratory research question—in addition to perceiving positive improvements in the foster children's reading and math ability, the foster parents and children also noted that several foster children exhibited fewer externalizing difficulties (with at least one child was noted to have demonstrated improved ADHD-related symptomatology), had more

confidence and positive self-perception, and a positive parent-child relationship. The experimental group foster parents and children also spoke of their level of satisfaction with the outcomes of the tutoring, a general feeling that it was a worthwhile experience, and a recommendation that other foster children could also benefit from foster parent-delivered tutoring programs. While it is possible that gains in academic outcomes may need time to translate into reciprocal mental health effects/gains that are detectable through statistical analyses, it would appear as though there is now a stronger basis upon which to suggest that educational interventions, such as tutoring, should continue to be used to improve the basic academic skills of foster children and that it is possible, even in the short-term, to observe improvements in their mental health or social-developmental status.

Taken together, the results of the current study contribute to the extant literature by documenting, at least on a preliminary basis within a child welfare context, that that *all* foster children, regardless of level of mental health difficulty and level of academic need, can make significant gains in their acquisition of basic skills in reading and mathematics. These gains have the potential to subsequently translate into more promising academic outcomes over the long-term. The quantitative (direct effect and moderation) and qualitative findings of the current study documented partial support for Slade and Wissow's heuristic parallel-process model: the mental health results lent support to 'pathway c' (i.e., that mental health seems to have some degree of influence on children's basic academic skills), while the academic-based findings also offered provisional support to 'pathway d' (i.e., that gains in basic academic skills likely 'spillover' and impact the domains of mental health and social-development).

The results also reinforced that gender differences do indeed exist in terms of acquisition of basic academic skills, and in the mental health and social-developmental domains. As stated,

the foster boys and girls made differential academic, mental health and social-developmental gains after having received the *TYCW* tutoring intervention. These findings begin to address one of the gaps in the literature noted previously by Forsman and Vinnerljung (2012) and Trout et al. (2003), who emphasized the importance of conducting separate analyses of students' academic achievements so that we can begin to understand whether gender differences truly exist. What remains unclear is the exact nature of *how* gender and mental health moderate children's academic skills (and vice-versa). There are multiple combinations and permutations of how the three primary factors investigated (i.e., gender, mental health, and academic skills) may combine and interact to influence and moderate children's abilities to acquire basic academic skills, their capacity to concentrate and process information learned, or their ability to produce school work. The influence of other factors, such as the level of implementation of the tutoring program and of tutoring more than one foster child, are also important considerations. However, as it stands, the answers to these questions are currently unknown and are beyond the scope of the current study, despite providing some further direction for future research.

The *RESPs for Kids in Care* project, under which the current study and that by Flynn et al. (2012) were conducted, has a number of strengths upon which such a conclusion can be drawn. First, the randomization of the foster children at the outset of the study helped to ensure that the two groups of children (i.e., experimental/tutoring and the wait-list control) would be relatively equivalent in terms of age, gender, academic skills and mental health difficulties.

Second, unlike Courtney et al. (2008), in which 12% of the young people in the control group somehow received the tutoring intervention intended only for the participants in the experimental group, the significant results of the current study can be attributed to the tutoring intervention with a higher-level of confidence. This is in good part due to the fact that none of

the foster children in the control group were reported to have received the *TYCW* tutoring intervention during the 2008/2009 school year. Moreover, the children in the current study were younger (6-13 years old) than those in the study conducted by Courtney et al. (14-15 years old) and received a greater number of hours of tutoring (~ 90 hours of tutoring in reading over the 30 weeks in the current study versus 17 hours of tutoring in reading over the two years). These two factors alone could account for the promising results, as some research has shown promising results when a one-on-one educational intervention, such as tutoring, is delivered by a parent or caregiver to younger (versus older) children, especially byway of promoting resilience through the building of a positive parent-child relationship in which there is trust, emotional support and better communication (Hawkins et al., 1999; Smokowski, 1998). Furthermore, other studies have noted that exposure to a moderate amount of tutoring produces more favourable outcomes than exposure to less intervention (Erion, 2006).

Third, unlike in Harper's (2012) study, all of the mental health questionnaires in this study were returned and any missing data was addressed at the time of the assessment with the foster parents, to ensure completeness of information. Fourth, the training provided to the foster parents, by the author of the *TYCW* program, included a component that attempted to establish whether the foster parents had mastery of the skills—a feature of training that is highly recommended by Erion (2006).

Lessons Learned and Future Directions

One of the benefits of the research on how to improve foster children's basic academic skills and achievement being in a formative stage is that future studies can take advantage of the lessons learned from their predecessors. A number of lessons have been learned from the implementation of the *RESPs for Kids in Care* project and will be presented here. Some of these

lessons have also been presented by Flynn et al. (2011; 2012) and Harper (2012; Harper and Schmidt, 2012). Although recommendations for future research have been made throughout the discussion section of this thesis, at the risk of some repetition in points and ideas, the purpose of this section is to highlight important aspects from this study that should be maintained while also promoting ideas for studies that will be designed and conducted over the years to come.

First and foremost, it is important to ensure that the training provided to the people delivering the program is specific, targeted, directed, long enough in duration, and provides essential and detailed information on how to actually implement the tutoring curriculum. Based upon the foster parents' reports, the one-day 6-hour training session was simply not enough for them to master all of the components of the *TYCW* tutoring program, including the reading, math, positive reinforcement and behaviour management. Indeed, the training provided to the foster parents in the current project focused primarily on the reading aspect of the curriculum with less on math and relatively little on the positive reinforcement (i.e., a rewards system) and behaviour management components. Moreover, although the training provided taught the foster parents the skills necessary to implement the reading curriculum to a level of mastery, there was no follow-up or monitoring of the foster parents' skills to ensure they maintained this mastery level of skills over the course of the intervention period. Therefore, it is recommended that, in the future, studies should provide more comprehensive training to the tutors with relatively equal emphasis placed on all facets of the program and to monitor the tutors' level of skills with the program on an ongoing basis. It is anticipated that attention to these aspect will help to ensure that the delivery of the program will be as smooth and successful as possible.

Implementation is another key factor to the success of any tutoring program. Although the current study did track implementation fidelity, although informally through foster parents'

weekly reports of their foster child(ren)'s progress to the project coordinator, a validated monitoring system was not implemented to track fidelity systematically, as it was happening, to ensure consistent implementation of the *TYCW* program with high(er) fidelity. Thus, an important consideration for future research efforts is to include a validated implementation grid to systematically monitor fidelity on an ongoing basis, in the moment (Slavin et al., 2011). This recommendation is made on the basis of information that was beyond the scope of the current study, but included in the first study from the *RESPs for Kids in Care* project by Flynn et al. (2012), in which it was determined that there was great variability in the implementation of the *TYCW* tutoring program amongst foster parents. It is necessary to highlight this point because Erion (2006), for example, has cited that it is important for studies to include quantifiable checks on how well parents who deliver tutoring programs assimilate the tutoring skills taught during their training. That is, training in and of itself may not be enough; Erion recommended that studies should determine the level of mastery of skills taught to parents and the degree to which they are able to implement the DI tutoring program initially and over the course of the tutoring program, as those studies that did include such checks and offered correction/support where needed produced larger effect sizes than those studies that did not include such checks.

Third, it is important to begin to document and begin the process of problem-solving some of the more common barriers foster parent-tutors encounter when delivering the academic tutoring program. For example, based upon the information provided by the foster parents, in response to the questionnaire completed at post-test, two of the most commonly reported barriers to foster parents' implementation of the tutoring were the children's display of challenging behaviour and their resistance to wanting to do the lessons. Other problems reported by the experimental group participants included: not knowing how to support the foster child when

he/she did not understand a lesson or achieve a fluency goal; some of the foster children became very frustrated with and had negative reactions to certain components of the tutoring program (e.g., the timed fluency tests); and some foster parents noted difficulties with scheduling time to complete the tutoring as it competed with other commitments, such as extracurricular activities. It is currently unclear to what degree these challenges served as barriers to (higher) levels of implementation, if at all. Regardless, these results do suggest that future studies should help prepare prospective foster parent-tutors for the difficulties they might encounter in implementing the tutoring. This point reinforces the first one made above, in which it was suggested that future training sessions should place a greater emphasis on helping foster parents understand how to use the reward system and behaviour management components in an effort to help the tutors find ways to either motivate the children to engage in the tutoring or to reduce disruptive behaviours. The more attention that is paid to the barriers that foster parents encounter, the better able we will become in identifying themes and providing problem-solving strategies to help counter these barriers.

The current study also attempted to engage foster parents in using the available resources that could have facilitated problem-solving around potential barriers, including participation in the monthly teleseminars and contacting the project coordinator or author of the tutoring curriculum. Although attempts were made over the course of the project to increase the numbers of foster parents using the available resources, these efforts did not appear to impact level of foster parent participation/engagement, the reasons for which are currently unclear. Indeed, several authors have noted that the logistical barriers parents face in becoming involved in their children's education should not be underestimated, both within the general population and within the foster care system (Goodall & Vorhaus, 2011; Tideman et al., 2011). Although many (foster)

parents would like to become involved in their children's education, many do not know how or have the confidence to become involved. Goodall and Vorhaus (2011) reported that parents are more likely to participate if they perceive that their involvement will have a direct, positive impact on their children and if the 'mechanics' of their involvement are clear. Based upon this premise, future studies may also want to include, within the foster parent training, a component in which some tutoring success stories of other foster parents and foster children are shared. This could serve as additional motivation to engage the foster parents in administering tutoring. However, if this is done, it would also be important to ensure that these success stories do not induce unrealistic expectations, as the evidence to date suggests that tutoring elicits only modest improvements in foster children's academic skills. Many DI programs, such as *TYCW*, are notorious for being straightforward, offering parents clear instructions on what they need to do and how they need to work with their children. For example, a few foster parents' responses to the open-ended questions suggested that they appreciated the *TYCW* program materials for giving them clear instructions on what they had to do, as it helped to remove any potential power struggles or disagreements with their foster children on how to proceed. Future studies should continue to investigate the features of tutoring programs that are effective in helping parents engage in the tutoring process and those that are a hindrance so that any barriers can be explicitly identified and addressed.

The current study made an effort to investigate the differential impact of tutoring on foster children's academic skills, and short-term mental health and social-developmental outcomes from multiple perspectives; the outcome of these analyses are promising in suggesting, at least on a very tentative preliminary basis, that there is a spillover effect from the improvement of basic academic skills to better mental health and social-development. As the

point was made earlier, it seems reasonable to recommend that future studies should continue to utilize mixed-methods (i.e., complementary use of quantitative and qualitative research methods) within the context of understanding the likelihood of a reciprocal effect between academic tutoring and the domains of mental health and social-development. Recalling the findings, the quantitative analyses failed to detect the generally positive and meaningful changes in the children's mental health difficulties (i.e., on externalizing subscale of the CBCL and, for the boys, the ADHD Index on the CADS-P) that were subsequently reflected in the foster parents' qualitative responses, and observations of the children's mean pre-to-post-test T-scores on the externalizing subscale of the CBCL (Achenbach & Rescoria, 2001) and the ADHD Index scale of the CADS-P (Conners, 2001). As more studies are conducted, additional information will become available to help improve or modify available programs so that the foster children can have an optimal chance of improving their academic and social-developmental skills while decreasing mental health difficulties.

Limitations

Although the results of the current study are promising, there are several limitations that need to be noted. One of the primary limitations of the current study is its sample size. The small numbers of the foster children included in the analyses (particularly the gender-based results) limits the generalizability of the results, which should also be interpreted with caution. Moreover, the foster children selected for participation in the current study were nominated by their child welfare workers based upon the fact that they were not demonstrating extreme difficulties academically or behaviourally. Although, at the pre-test, the foster children in the current study appeared to be relatively representative of other foster children across Ontario in the care of a Children's Aid Society in 2008-2009 (based on age, gender, grade and mental

health difficulties), the findings reported herein are likely not generalizable to all foster children, particularly those who demonstrate greater behaviour or emotional disturbance and greater academic need. This also precludes any comments or expectations of how the *TYCW* tutoring curriculum should or could be modified in order to make it deliverable to other foster children with greater behavioural or mental health disturbances. The characteristics of the foster parents were not assessed to determine how representative they are of other foster parents in Ontario, or to offer a basis upon which we can speculate what would make a 'good' foster parent-tutor.

A second limitation is that there was no formal assessment of the barriers certain foster parents may have faced in implementing the tutoring curriculum—information that could have been very helpful to inform future projects on the difficulties that could be anticipated by the individuals delivering an academic tutoring intervention with foster children. Likewise, the current study did not include an assessment of the type of maltreatment that the foster children experienced prior to their entry into foster care. This could be relevant information to include in future studies because it has been well-documented that, for example, children who endure a neglectful upbringing differ from children who experience physical or sexual abuse in terms of academic performance, and behavioural and emotional well-being (see Romano, Marquis, Babchishin, and Fréchette, 2012, for an overview). Although it is very difficult to disentangle the harm suffered by the children, which led to their placement in foster care, and the difficulties that they display (Driscoll, 2011), the inclusion of such historical information could help to shed some light on the potential differential needs of children who experience different forms of maltreatment.

Third, there was no assessment to determine whether the foster children were experiencing trauma-related symptoms. Research has indicated that it is not uncommon for

children who have experienced maltreatment to display traumatic-stress symptoms, which, especially in children, can often appear to be like and can be mistaken for other types of observable difficulties, including ADHD-like symptoms (see Romano et al., 2012). Future studies may want to include a brief module on trauma, within the foster parent training session, to bring to their awareness the impact of trauma on children's overall well-being and their abilities to perform to their academic potential. Furthermore, should it be determined that foster children are experiencing significant trauma-related symptoms, it might be worthwhile to conduct a small-scale controlled pilot intervention in a trauma-based intervention is provided in tandem with academic tutoring to determine if there are benefits above and beyond the academic-alone intervention.

Fourth, pre- and post-test information was obtained from only two sources—the foster parents and children who were direct participants, neither of whom were blind to the intervention group to which they had been assigned at the pretest—rather than gaining the perspective of a third-party, such as the child welfare worker or the child's school teacher. Therefore, the use of multiple informants, including the foster child him or herself, as well as the Children's Aid workers or the foster children's teachers, may be useful resources of additional and corroborating information. For example, although nonsignificant results were obtained in relation to the children's internalizing problems, perhaps it may be more difficult for a foster parent to notice and objectively comment on what is going on with their foster child as compared to a teacher, who has contact with many other children, giving a basis for comparison within. As well, the foster children's worker and teacher were not formally engaged in the study, which may have had some degree of impact on the outcomes. As reported by Flynn et al. (2011; 2012), some of CAS lead hands were more involved in providing support to foster parents than those at other

agencies and this seemed to have made a difference in the foster parents' experiences with the tutoring curriculum. The qualitative findings of the current study also brought forth the reports of some foster parents who noted the value of the support received from their foster children's teacher and, in other cases, the negative impact on the children when the teachers were not supportive of their receipt of tutoring.

Finally, other noteworthy limitations of the current study include: the *p*-values were not adjusted for despite the large number of comparisons that were made (including the 10 multiple regressions); the open-ended questions were not pre-tested; there was no assessment of children's IQ or level of cognitive functioning at pre-test; we did not control for children who had previous diagnoses of learning disabilities; and only English-speaking foster parent-child(ren) pairs were recruited as participants. Despite the limitations, the meaningful results reported within the two studies of the overarching main project (i.e., the study by Flynn et al., 2012, and the current thesis) point to the need for replication with a larger sample and a continuation of an experimental design.

Conclusions

By nature, children in foster care often lack the family and social supports that many children in the general population enjoy, which places them at an increased risk of significant disadvantage across a number of outcomes, including education, mental health, and social-development. It is essential to provide these at-risk foster children interventions that can be implemented early, effectively, and efficiently to address behavioural and academic concerns (Lane, 1999). As research on best-practices has indicated that parent training is an effective intervention strategy, the results of the current study contribute to this literature, from a child welfare perspective. Certainly, the very promising findings of the current study contribute to the

growing sense of optimism that boys and girls in care, most of whom were at risk of academic difficulties in part due to their experiences of maltreatment in their families of origin and ongoing mental health and social-developmental difficulties, can and do benefit from tutoring interventions, such as the *TYCW* curriculum, that are grounded in direct instruction theory. The results have also begun to set the stage to bring increasing attention to the additional benefits that accompany the gains in academic skills gains after having received a scholastic-focused tutoring intervention; the spillover effects specifically noted within this study included improvements in the foster children's ADHD-symptomatology, externalizing behaviour, self-perception and self-confidence, and relationship with their foster parents. With these results, it remains conceivable that the spillover effects did not stop with these domains, and that other spheres of the foster children's lives, that currently unknown, could have also been positively impacted.

The demonstrated effectiveness of foster parent-delivered tutoring in improving foster children's basic academic skills is important for at least three reasons. First, it helps to establish a basis upon which we can begin to confirm, from a child welfare perspective, that foster parent tutoring may be as effective as parent tutoring in the general population (Erion, 2006). Second, using foster parents as tutors capitalizes on a relatively untapped resource for improving foster children's educational outcomes and is consistent with Jackson's (2007) advocacy of encouraging greater involvement of foster parents in the academic education of the foster children in their care. Third, foster parent-delivered tutoring would complement school-based efforts to improve the educational performance of children involved with the child welfare system (e.g., Tideman et al., 2011). For example, in Ontario, tutoring would improve foster children's basic academic skills and also allow them to garner the maximum benefit from school-system change efforts currently taking place in the province, such as the Crown Ward

Championship Teams. These teams are aimed at promoting collaborative peer support, mentoring, and guidance from a range of service providers, including, child welfare agencies, schools, colleges, and universities (Ontario Association of Children's Aid Societies, 2007).

It is the hope that the very exciting and promising results of this study (and the *RESPs for Kids in Care* project within which it was conducted) will continue to bring attention to, interest in, and understanding of the educational and mental health needs of foster children in Canada and across the world. Although it remains premature to draw conclusions about 'what works best' (Forsman & Vinnerljung, 2012), there is now evidence lending itself to the suggestion that DI-based academic tutoring programs are promising interventions that can promote a variety of positive outcomes amongst children in the general population and foster care system who are at-risk for academic failure. The more research that is conducted and attention brought to effective ways of intervening with foster children, and their gender-specific needs, we will be able to more readily identify a few key ways to focus our efforts to help promote better outcomes and functioning for the particularly vulnerable of children who are being cared for through the foster care system.

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Appendix A

Foster Child Assent and Foster Parent Consent Forms

RESPs for Kids in Care project

Youth Assent Form

My name is Robert Flynn. I have found that many youth in care have some challenges in school. Since education is so important for the future of youth, I am trying to learn about ways to improve the school success of youth in care. If you would like, you can be in my study, which will last for 2 years, from November, 2008 to July, 2010.

If you decide you want to be in my study, your Children's Aid Society (CAS) will open and deposit money in a Registered Education Savings Plan (RESP) at the bank to save money to help pay for your education after high school. If you decide to participate, you will need to fill out some tests with me or members of my team so that we can see your progress throughout the 2 years of the study. You will always be free to decide to not answer any questions that you are not comfortable with. As part of this study, you may also receive tutoring from your foster parents who may be trained to help you to improve your reading and math.

I will put what I learn about you together with what I learn about other youth, so no one can tell what answers came from you. When I tell other people about my research, I will not use your name, so no one can tell who I am talking about.

Your CAS and foster parents have to say it's OK for you to be in the study. After they decide, you get to choose if you want to do it too. If you don't want to be in the study, no one will be mad at you. If you want to be in the study now and change your mind later, that's OK. You can stop at any time.

If you have any questions about the study or if you decide you don't want to be in the study any more, you can contact my assistant Marie-Pierre Paquet.

I will give you a copy of this form in case you want to ask questions later.

Agreement

I have decided to be in the study even though I know that I don't have to do it. All my questions have been answered.

Participant's signature:_____ Date:_____

Robert J. Flynn _____
PhD, CPsych, Principal Investigator

CONSENT FORM FOR FOSTER PARENTS

I, (name of foster parent) _____, wish to participate in the RESPs for Kids in Care study that is being carried out in collaboration with my local CAS. This research is directed by Dr. Robert Flynn of the Centre for Research on Educational and Community Services at the University of Ottawa. The study is intended to address the problem of poor educational outcomes among young people in care, and is funded by the federal department of Human Resources and Social Development Canada (HRSDC). The purpose of the study is to test the relative effectiveness of two interventions to improve short-term educational outcomes and social behavior among young people in care. The two interventions are, respectively, (1) a Registered Education Savings Plan (RESP), with an appropriate orientation for foster parents as well as the child's child welfare and family resource workers; and (2) the RESP/orientation, plus training in educational tutoring for foster parents, supplemented by an orientation for the child welfare and family resource workers that will allow them to support foster parents' efforts.

If I, my foster child, and child welfare personnel agree to participate, my foster child will be randomly assigned to one of these interventions, will receive the intervention and be monitored for 2 years, that is, from November, 2008 to July, 2010. If the second intervention (foster parent tutoring) produces clearly better educational outcomes than the baseline (RESP) intervention, we intend to offer the foster parent tutoring intervention in the second year to the young people who, in the first year, will have received the baseline (RESP) intervention.

If I agree to participate, I will agree to collaborate with the child's workers in giving repeated message to my foster child, throughout the 2 years of the study, that the RESP is a tangible sign of the child's value and an important investment in his or her future. I will agree to undergo a day of training in methods that I will use to tutor my child if he or she is assigned to the foster parent tutoring intervention. I will agree to commit to tutoring my foster child, if my foster child is assigned to the foster parent tutoring intervention, for the 2 years of the study. I will also agree to be monitored regularly, to make sure that I am applying the methods that I have learned.

My participation is strictly voluntary. I am free to refuse to participate or to withdraw from the study at any moment, without penalty. If I choose not to participate, my foster child and I will not suffer any negative consequences.

There are two copies of the consent form, one that I will keep and one that I will return to the researchers. If I have any questions about this study, I may contact the project coordinator, Ms. Marie-Pierre Paquet. If I have questions about the ethical aspects of the research or I wish to make a complaint about how it is being conducted, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, 550 Cumberland St, Room 160. Tel. (613) 562-5387; Fax. (613) 562-5318; e-mail ethics@uottawa.ca

Participant's signature:_____DATE:_____

Robert J. Flynn _____
PhD, CPsych, Principal Investigator

WE ARE AWARE THAT YOUR TIME IS PRECIOUS. THANK YOU FOR READING THIS MATERIAL AND FOR YOUR PARTICIPATION.

Appendix B

Eligibility Requirements for the Foster Children and Foster Parents

Eligibility Criteria for Nomination of Foster Children to Participate in *RESPs for Kids in Care* Study

1. Aged approximately 6-13 years and in grades 2 through 7 (in the 2008-2009 school year)
2. Assessed and nominated by the child's child welfare worker and supervisor as likely to benefit from foster parent tutoring
3. Neither a very strong nor an extremely weak nor an extremely behaviourally disturbed student (as assessed by the child welfare worker and supervisor)
4. Fluent in English (as the instructional materials for the educational intervention exist only in English)
5. Resident in a foster home or kinship care home (but not a group home), whether run by the local CAS or by a private provider
6. In a stable placement (as assessed by the child welfare worker and supervisor)
7. Either a Crown Ward or Society Ward, and thus likely to remain in the study
8. The child gives his or her informed assent to participate in the study
9. Participation in the study will be limited to two foster children per home (as nominated by the CAS), to limit the burden on the foster parent (who may have up to four foster children in the home).

Eligibility Criteria for Nomination of Foster Parents to Participate in *RESPs for Kids in Care* Study

1. Assessed and nominated by their local CAS as sufficiently motivated and literate to function as tutors
2. Ability to read well
3. Willing to undergo a day of tutoring training
4. Willing to have their tutoring performance monitored periodically
5. Committed to tutor their foster child for 3 one-hour sessions per week during the school year and for 1 one-hour session during July and August
6. Willing to collaborate with the child's child welfare worker in conveying the significance of the RESP to the child as an important investment in his or her future

   Has access to a computer and the Internet in the home (to run the computer-based mathematics software and to communicate regularly with the project staff via e-mail).

Appendix C

Teach Your Children Well Reading Level Assessment Passages

1

Holiday Fun

In the summer my family loves to go camping. Usually we put up our tent in the woods beside a lake or a river. During the day we swim, play games or go hiking on the trails in the forest. In the evening we cook dinner over a big campfire. After we eat we sing songs, tell stories or just lie on the ground gazing at the stars in the sky. It is so much fun that every year I can hardly wait for our holidays to begin.

2

At the Circus

Today the circus was in town. It was a chance
To see lions and tigers and clowns in bright costumes. I especially wanted to watch the famous flying pigeons. I visited their giant cage. I did a quick count. There were probably fifty pigeons inside. All of the had beady eyes as black as coral. They ruffled their glistening feathers. I stared at them but they ignored me. The announcer stepped up to the podium. There was a thunder of applause. I raced up the stairs to my seat. The circus was about to begin.

3

Quite an Experience

Here I was, standing in astonishment at the top of a gigantic skyscraper! The full moon was massive and seemed to hover straight overhead. Its brilliance reflected off the surface of the windows of each building surrounding me. I gasped slightly at the chill of the night and began to lament that I had not worn warmer garments. The mayor of our city, who as a notoriously dapper politician, and two jubilant astronauts were standing nearby, along with other equally captivated officials of the community. They all were watching with awe a group of amateur but nimble and very athletic entertainers who were performing a complex sequence of spectacular somersaults. I had never had an aversion to heights but I knew that I would never be courageous enough to join them so far from the ground. What an amazingly dramatic and splendid experience!

4
The Lewis and Clark Expedition

After the Louisiana Purchase, touted to be “the greatest real estate deal in history,” the American Midwest and West lay open as an enticing and expansive terrain ripe for exploration and adventure. Meriwether Lewis, an ambitious and no-nonsense young man, together with his close friend, Captain William Clark, and a contingent of Army engineers, were officially commissioned by President Thomas Jefferson to discover a water passage from the Mississippi to the Pacific. It was a formidable task, one fraught with danger, deprivation and loneliness. The small band had to be forever vigilant of both hostile natives and a grueling environment. Despite a seemingly hopeless plight, they carried on, stoically and courageously. Close to three years after their departure, having conquered famine and fatigue, seclusion in the wilderness, and the trek over perilous mountain ranges, they stood exhilarated by the sight of the Pacific Ocean. At that moment they were oblivious to their past hardships. They had succeeded; they were triumphant.

Appendix D

Experimental Group Foster Parent Questionnaire

The RESPs for Kids in Care Project: Caregiver Survey
(Intervention group, 2008-2009)

We want to know your thoughts about what has happened this year since we met with you in the Fall, 2008. The following questions ask you about your experience with the tutoring this year. We also ask you to update information that may have changed since the fall. Your answers will help us evaluate the success of the first year of the tutoring program and will help us plan for next year, 2009-2010. Please answer the questions as completely and as frankly as possible.

1. Children's Aid Society:_____ Today's date:_____

2. Your name:_____

3. If your contact information has changed since you met with the research team last Fall, 2008, please fill out the following:

Your telephone number: (_____)_____

Your email: _____

Your mailing address:
_____ (street and number, apt. if applicable)
_____ (city, province)
_____ (postal code)

4. Between the date you met with the research team in the Fall, 2008, and today, how often, on average, did you communicate clearly and explicitly to your foster child (or children), the essence of the following message:

"[Child's name], you are valued and important. Education is a key to your future. That is why your CAS (or FACS) is setting money aside for you in the bank to pay for your education after high school. You have a great future ahead of you, and this money will help you continue your studies so that you can achieve your dreams."?

Please choose one of the following answers:
a) I did not communicate this message
b) I communicated it less than once per week
c) I communicated it about once per week
d) I communicated it several times per week
e) I communicated it daily

Tutoring training, coaching, and support:

5. Looking back at the training you received from the author of the Teach Your Children Well method (herein the author) last Fall, 2008, how helpful were the following aspects of the training?

a) The Teach Your Children Well reading materials	□ Very helpful	□ Somewhat helpful	□ Not helpful
b) The Teach Your Children Well math materials	□ Very helpful	□ Somewhat helpful	□ Not helpful
c) The author's CDs with an overview of the training and step-by-step demonstration of the tutoring	□ Very helpful	□ Somewhat helpful	□ Not helpful
d) The author's hand-outs	□ Very helpful	□ Somewhat helpful	□ Not helpful
e) The author's explanations of the reading tutoring	□ Very helpful	□ Somewhat helpful	□ Not helpful
f) The author's explanations of the math tutoring	□ Very helpful	□ Somewhat helpful	□ Not helpful
g) The author's explanations of the reward (i.e., point) system	□ Very helpful	□ Somewhat helpful	□ Not helpful

6. Concerning the support you received from the author of the Teach Your Children Well method (herein the author), the research team, and your agency:

Newsletters a) Did you read the monthly newsletters? □ Most or all of the time □ Occasionally □ Rarely or never
Correspondence b) Did you read correspondence by email or regular mail from Marie-Pierre Paquet, the project coordinator? □ Most or all of the time □ Occasionally □ Rarely or never
Tele-seminars c) Did you join the monthly tele-seminars? □ Most or all of the time □ Occasionally □ Rarely or never
Weekly data d) Did you submit data weekly to Marie-Pierre Paquet, the project coordinator? □ Most or all of the time □ Occasionally □ Rarely or never
Contact with coach e) Did you call the author's toll-free tutor hotline for help when you had a problem or a question? □ Most or all of the time □ Occasionally □ Rarely or never
Contact with research coordinator f) Did you call Marie-Pierre Paquet, the project coordinator, when you had a problem or a question? □ Most or all of the time □ Occasionally □ Rarely or never
Reward system g) Did you use a reward system with your foster child (or children)? □ Most or all of the time □ Occasionally □ Rarely or never
Gantt chart h) Did you use the Gantt chart as a tool to plan out the tutoring (i.e., by comparing the number of lessons you expected to complete in a given timeframe to the number of lessons you actually completed) to ensure that you met the tutoring requirements by the end of the 2008-2009 school year?

□ Most or all of the time □ Occasionally □ Rarely or never

7. Overall, do you feel that you were adequately trained to tutor your foster child (or children)?

□ Yes □ No

If No, please explain:_____
_____
_____
_____
_____
_____

8. Please note below any suggestions you have to improve the training in the future:

_____
_____
_____
_____
_____
_____
_____

9. How much support did you receive from your CAS (or FACS) in relation to the project?

□ A great deal
□ Some
□ Very little

If you received support, what was it? _____
_____
_____
_____

10. Between the date you received the training and today, for how many weeks did your foster child (or children) have access to the math software on a functioning computer?

a) for 30 weeks or more
b) for 20-29 weeks
c) for 10-19 weeks
d) for 0-9 weeks

11. Please check if any of the following interfered with your tutoring of your foster child (or children):

□ addition of a new child (foster child or birth child) in your home?
□ illness of a foster child involved in the study which lasted longer than 2 weeks?
□ illness of yourself that lasted longer than 2 weeks?
□ illness of another member of your household that lasted longer than 2 weeks?
□ surgery of a foster child involved in the study?
□ surgery of yourself?
□ too much homework?
□ time demands of your household's involvement in extracurricular activities?
□ behavior problems of the foster child (or children)?
□ resistance of the foster child (or children) to do the tutoring?

□ visits of the foster child (or children) with his/her birth parents?
□ trips?
□ change in schools?
□ other:_____

12. Did your foster child (or children)'s teacher(s) reduce the amount of homework as a result of your use of the two letters sent to you by the research team (i.e., the first letter was sent in October-November, and the second, in January-February)?

□ yes □ no □ I didn't use the letter

13. Would you recommend the Teach Your Children Well materials to other foster parents for use in tutoring their foster children?

a) yes, without hesitation
b) yes, with some hesitation
c) no, I would not recommend these materials to other foster parents

14. The tutoring process required you to do the following each week, for each foster child involved in the study: 1) To spend 2 hours tutoring your child in reading; 2) To spend 30 min listening to your child read out loud; and 3) To ensure that your child spent at least 30 min working with the math on the computer.

Of the four following statements, please choose the one that is closest to your own opinion:

a) 3 hours per week was a reasonable requirement that I was able to achieve most weeks.
b) 3 hours per week was a difficult goal to attain, but I managed to achieve it most weeks.
c) 3 hours per week is a reasonable requirement, but I was unable to achieve it at least half of the time.
d) 3 hours per week is too much time to ask of foster parents to spend on tutoring. The most I could spend each week would be _____ hours.

15. Did you receive any additional math materials?

a) No, I only received the math CD.
b) Yes, in addition to the math CD, I received the Math Counting Fluency Teacher's Manual.
c) Yes, in addition to the math CD, I received: (1) the Math Counting Fluency Teacher's Manual; (2) a Collection of Quick Start Lessons to Teach Basic Arithmetic Concepts & Operations; and (3) Student Exercise Worksheets for Arithmetic Concepts & Operations

Background information on the foster child or children in your home involved in the RESPs for Kids in Care study:

16. If you have only one foster child involved in the study, use the left column only. If you have two, then use both columns.

Child 1

a) Name : _____

School:

b) At the present time, does your foster child have an Individual Education Plan (IEP) that was established by an Identification and Placement Review Committee (IPRC)?

☐ Yes ☐ No

c) If your foster child has an IEP, do you know which category (or categories) were identified in the IPRC process?

☐ Yes ☐ No

If Yes, please check the category (or categories) identified in the IPRC process:

☐ **Behavior**
Communication
☐ Autism
☐ Deaf and Hard-of-Hearing
☐ Language Impairment
☐ Speech Impairment
☐ Learning Disability
☐ **Multiple**
Intellectual
☐ Giftedness
☐ Mild Intellectual Disability
☐ Developmental Disability
Physical
☐ Physical Disability
☐ Blind and Low Vision

d) If your foster child does have an IEP, in your opinion, is it being satisfactorily implemented?

☐ Yes ☐ No ☐ Uncertain

Medications:

e) Please list the prescription medication(s) - and current dosage for each - that your foster child is currently receiving to improve his/her attention, mood or behavior (e.g., Ritalin, 20 mg per day)

Medication #1:_____ Dosage:_____
Medication #2:_____ Dosage:_____
Medication #3:_____ Dosage:_____
Medication #4:_____ Dosage:_____

f) If you listed one or more prescription medications in the previous question, has the dosage changed since you met with the research team last Fall, 2008?

☐ I did not list any prescription medications in question e
☐ no, the dosage did not change since Fall, 2008
☐ yes, the dosage did change since Fall, 2008
If yes, please comment:_____
_____
_____
_____
_____
_____
_____

Tutoring:

As you know, Teach Your Children Well is the method of tutoring in which you received training in the Fall, 2008, to apply with one foster child (or, in some cases, two children). Please keep this in mind when you answer the following questions.

g) In addition to Teach Your Children Well, did the child also receive any of the following services from any source during the period of October, 2008 - June, 2009?

1. Homework club	☐ yes ☐ no If yes, how many weeks? ____
2. Peer tutoring (i.e., tutoring by another young person) at school or out of school	☐ yes ☐ no If yes, how many weeks? ____
3. Professional tutoring (i.e., Kumon, Sylvan, etc.)	☐ yes ☐ no If yes, how many weeks? ____
4. Computer-based help with reading or math other than Teach Your Children Well	☐ yes ☐ no If yes, how many weeks? ____
5. Any other tutoring except Teach Your Children Well	☐ yes ☐ no If yes, how many weeks? ____

Child 2

a) Name : _____

School:

b) At the present time, does your foster child have an Individual Education Plan (IEP) that was established by an Identification and Placement Review Committee (IPRC)?

☐ Yes ☐ No

c) If your foster child has an IEP, do you know which category (or categories) were identified in the IPRC process?

☐ Yes ☐ No

If Yes, please check the category (or categories) identified in the IPRC process:

☐ **Behavior**
Communication
☐ Autism
☐ Deaf and Hard-of-Hearing
☐ Language Impairment
☐ Speech Impairment
☐ Learning Disability
☐ **Multiple**
Intellectual
☐ Giftedness
☐ Mild Intellectual Disability
☐ Developmental Disability
Physical
☐ Physical Disability
☐ Blind and Low Vision

d) If your foster child does have an IEP, in your opinion, is it being satisfactorily implemented?

☐ Yes ☐ No ☐ Uncertain

Medications:

e) Please list the prescription medication(s) - and current dosage for each - that your foster child is currently receiving to improve his/her attention, mood or behavior (e.g., Ritalin, 20 mg per day)

Medication #1:_____ Dosage:_____
Medication #2:_____ Dosage:_____
Medication #3:_____ Dosage:_____
Medication #4:_____ Dosage:_____

f) If you listed one or more prescription medications in the previous question, has the dosage changed since you met with the research team last Fall, 2008?

☐ I did not list any prescription medications in question e
☐ no, the dosage did not change since Fall, 2008
☐ yes, the dosage did change since Fall, 2008
If yes, please comment:_____
_____
_____
_____
_____
_____
_____

Tutoring:

As you know, Teach Your Children Well is the method of tutoring in which you received training in the Fall, 2008, to apply with one foster child (or, in some cases, two children). Please keep this in mind when you answer the following questions.

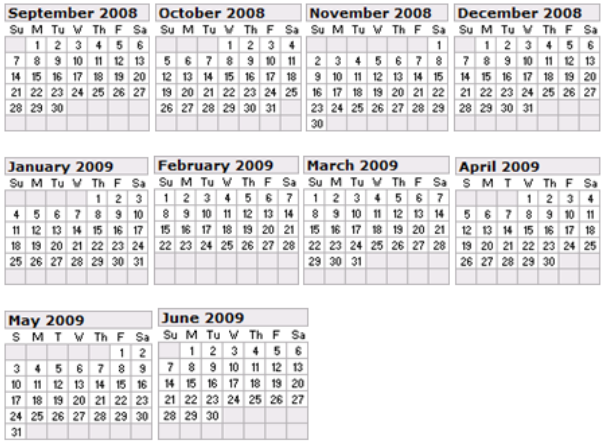
g) In addition to Teach Your Children Well, did the child also receive any of the following services from any source during the period of October, 2008 - June, 2009?

1. Homework club	☐ yes ☐ no If yes, how many weeks? ____
2. Peer tutoring (i.e., tutoring by another young person) at school or out of school	☐ yes ☐ no If yes, how many weeks? ____
3. Professional tutoring (i.e., Kumon, Sylvan, etc.)	☐ yes ☐ no If yes, how many weeks? ____
4. Computer-based help with reading or math other than Teach Your Children Well	☐ yes ☐ no If yes, how many weeks? ____
5. Any other tutoring except Teach Your Children Well	☐ yes ☐ no If yes, how many weeks? ____

Your involvement in the Teach Your Children Well tutoring program:

h) During the period of October, 2008 - June, 2009, how many weeks of tutoring were you able to provide to your foster child? Please try to estimate as accurately as possible (without overestimating or underestimating) using the calendar below.

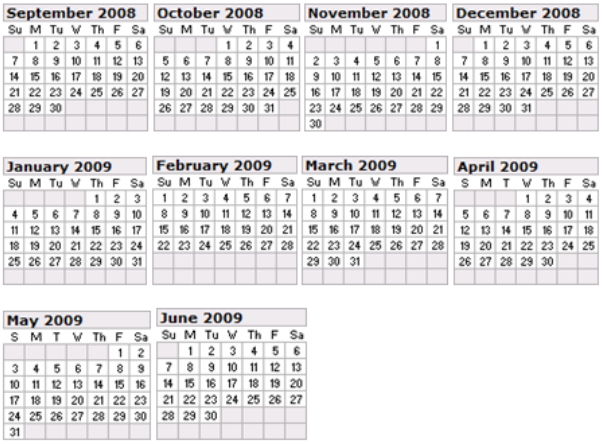
Tutoring in reading	**Tutoring in math**
☐ More than 30 weeks	☐ More than 30 weeks
☐ 30 weeks	☐ 30 weeks
☐ 25-29 weeks	☐ 25-29 weeks
☐ 20-24 weeks	☐ 20-24 weeks
☐ 15-19 weeks	☐ 15-19 weeks
☐ 10-14 weeks	☐ 10-14 weeks
☐ 5-9 weeks	☐ 5-9 weeks
☐ 0-4 weeks	☐ 0-4 weeks



Your involvement in the Teach Your Children Well tutoring program:

h) During the period of October, 2008 - June, 2009, how many weeks of tutoring were you able to provide to your foster child? Please try to estimate as accurately as possible (without overestimating or underestimating) using the calendar below.

Tutoring in reading	**Tutoring in math**
☐ More than 30 weeks	☐ More than 30 weeks
☐ 30 weeks	☐ 30 weeks
☐ 25-29 weeks	☐ 25-29 weeks
☐ 20-24 weeks	☐ 20-24 weeks
☐ 15-19 weeks	☐ 15-19 weeks
☐ 10-14 weeks	☐ 10-14 weeks
☐ 5-9 weeks	☐ 5-9 weeks
☐ 0-4 weeks	☐ 0-4 weeks



i) In an average week of tutoring, how much time did you spend with your foster child on the following:

1. Tutoring in reading using the instructor's manual	☐ more than 2 hours ☐ 1.5-2h ☐ 1-1.5h ☐ 30 min - 1h ☐ less than 30 min
2. Listening to your foster child read out loud (i.e., reading practice)	☐ 1 hour or more ☐ 45-60 min ☐ 30-45 min ☐ 15-30 min ☐ less than 15 min
3. Supervising your foster child working with the math CD on the computer?	☐ 1 hour or more ☐ 45-60 min ☐ 30-45 min ☐ 15-30 min ☐ less than 15 min
4. Teaching math using additional math materials (i.e., counting skills) distributed to you by Michael Maloney or the research team	☐ Not applicable ☐ 1 hour or more ☐ 45-60 min ☐ 30-45 min ☐ 15-30 min ☐ less than 15 min

i) In an average week of tutoring, how much time did you spend with your foster child on the following:

1. Tutoring in reading using the instructor's manual	☐ more than 2 hours ☐ 1.5-2h ☐ 1-1.5h ☐ 30 min - 1h ☐ less than 30 min
2. Listening to your foster child read out loud (i.e., reading practice)	☐ 1 hour or more ☐ 45-60 min ☐ 30-45 min ☐ 15-30 min ☐ less than 15 min
3. Supervising your foster child working with the math CD on the computer?	☐ 1 hour or more ☐ 45-60 min ☐ 30-45 min ☐ 15-30 min ☐ less than 15 min
4. Teaching math using additional math materials (i.e., counting skills) distributed to you by Michael Maloney or the research team	☐ Not applicable ☐ 1 hour or more ☐ 45-60 min ☐ 30-45 min ☐ 15-30 min ☐ less than 15 min

j) How many lessons have you completed in the Toolbox Series for Literacy or the Teach Your Children To Read Well series? Please specify which book you were working from (i.e., Toolbox Level 1 or 2, Teach Your Children to Read Well 1A, 1B, 3 or 4).

Book(s): _____ #of lessons: _____
_____ _____
_____ _____
_____ _____
_____ _____

k) In an average week of tutoring, how much time in total did your foster child spend working on the math on the computer (with or without your supervision)?

- ☐ 1 hour or more
- ☐ 45-60 min
- ☐ 30-45 min
- ☐ 15-30 min
- ☐ less than 15 min

l) When your foster child used the math software on the computer, what level of supervision did he/she require from an adult in the home:

- ☐ frequent supervision
- ☐ supervision from time to time
- ☐ little or no supervision

m) In general, how cooperative was your foster child with the tutoring?

- ☐ Child cooperated well and enjoyed doing the tutoring.
- ☐ Child cooperated most of the time.
- ☐ Child did not cooperate, needed strong encouragement to do the work.
- ☐ Child did not want to do the work, had temper tantrums to avoid it.

j) How many lessons have you completed in the Toolbox Series for Literacy or the Teach Your Children To Read Well series? Please specify which book you were working from (i.e., Toolbox Level 1 or 2, Teach Your Children to Read Well 1A, 1B, 3 or 4).

Book(s): _____ #of lessons: _____
_____ _____
_____ _____
_____ _____
_____ _____

k) In an average week of tutoring, how much time in total did your foster child spend working on the math on the computer (with or without your supervision)?

- ☐ 1 hour or more
- ☐ 45-60 min
- ☐ 30-45 min
- ☐ 15-30 min
- ☐ less than 15 min

l) When your foster child used the math software on the computer, what level of supervision did he/she require from an adult in the home:

- ☐ frequent supervision
- ☐ supervision from time to time
- ☐ little or no supervision

m) In general, how cooperative was your foster child with the tutoring?

- ☐ Child cooperated well and enjoyed doing the tutoring.
- ☐ Child cooperated most of the time.
- ☐ Child did not cooperate, needed strong encouragement to do the work.
- ☐ Child did not want to do the work, had temper tantrums to avoid it.

Improvements:

n) In your opinion, how much has the tutoring program contributed to improvements in the following:

1. Child's reading achievement?	☐ a great deal ☐ some ☐ very little
2. Child's math achievement?	☐ a great deal ☐ some ☐ very little
3. Child's overall school work?	☐ a great deal ☐ some ☐ very little
4. Child's overall positive attitude towards school?	☐ a great deal ☐ some ☐ very little
5. Child's self-esteem?	☐ a great deal ☐ some ☐ very little
6. Child's behavior?	☐ a great deal ☐ some ☐ very little
7. Child's happiness?	☐ a great deal ☐ some ☐ very little
8. Child's relationship with you?	☐ a great deal ☐ some ☐ very little

Improvements:

n) In your opinion, how much has the tutoring program contributed to improvements in the following:

1. Child's reading achievement?	☐ a great deal ☐ some ☐ very little
2. Child's math achievement?	☐ a great deal ☐ some ☐ very little
3. Child's overall school work?	☐ a great deal ☐ some ☐ very little
4. Child's overall positive attitude towards school?	☐ a great deal ☐ some ☐ very little
5. Child's self-esteem?	☐ a great deal ☐ some ☐ very little
6. Child's behavior?	☐ a great deal ☐ some ☐ very little
7. Child's happiness?	☐ a great deal ☐ some ☐ very little
8. Child's relationship with you?	☐ a great deal ☐ some ☐ very little

Appendix E

Open-Ended Questions for Foster Children and Foster Parents at Post-Test

Open-ended questions for foster parents

Ask questions verbally, take notes and record.

"I am going to ask you questions about what impact, if any, the tutoring program has had on your relationship with your participating foster child (or children), and their emotional wellbeing and behavior."

1. In your opinion, did your tutoring of your foster child (or children) affect your relationship with the child (or children), either positively or negatively?

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2. In your opinion, did your tutoring of your foster child (or children) have any impact, positive or negative, on his/her emotional wellbeing or behavior?

Open-ended questions for children

Ask questions verbally, take notes and record.

"During the school year, you had tutoring from your foster parent."

1. Now that you've had the tutoring, do you find it easier to do reading and math homework than before? Or has there been really no change?

2. Did the tutoring make any difference in the way you get along with your foster parent who did the tutoring with you?

Appendix F

CAS Letter of Agreement for Project Collaboration

The RESPs for Kids in Care Project: Letter of Agreement

This letter of agreement describes the terms of research collaboration (i.e., the mutual rights and responsibilities) between **Insert name of Children's Aid Society here** and the research team members (whose names are listed at the end of this letter) of the RESPs for Kids in Care Project: A Randomized Field Trial to Improve Educational Achievement Among Children Living in Out-of-Home Care.

Project Objective

The RESPs for Kids in Care project is a three-year randomized field trial (2007-2010), funded by the Government of Canada's Canada Education Savings Program in Human Resources and Social Development Canada, and conducted by the Centre for Research on Educational and Community Services at the University of Ottawa. The purpose of the project is to evaluate the effectiveness of a well organized and well structured educational intervention that promises to produce a significant improvement in the educational outcomes of children served in out-of-home care by local Children's Aid Societies (CASs) in Ontario. Children in care, aged approximately 9-12 years, in grades 4-7 in the next school year (2008-2009), nominated by participating CASs as likely to benefit from the educational intervention, and who assent to taking part in the project will be randomly assigned to one of two interventions. The first intervention will consist of a Registered Education Savings Plan (RESP) and an accompanying orientation of the child's child welfare worker and foster parents or kinship caregivers. The educational intervention will consist of the RESP intervention *plus* training for the foster parent or kinship caregiver in educational tutoring. Both interventions will last 10 months. During a second 10-month intervention phase, the children who received the RESP intervention will all receive the second (i.e., educational) intervention.

Training of foster parents, kinship caregivers, and CAS staff will begin in September, 2008. The first 10-month intervention period will begin on November 1, 2008, and will continue until September 1, 2009. The second 10-month intervention phase will begin on September 1, 2009, and end on July 1, 2010. The final project report will be submitted on October 31, 2010.

Mutual Responsibilities of the Local Children's Aid Society (CAS) and of the RESPs for Kids in Care Project Research Team

Responsibilities of the Local CAS

In agreeing to collaborate in this research project, the local CAS agrees to the following:

- ✓ To collaborate with the research team in its efforts to address the project objective mentioned above.

- ✓ To designate a lead person (i.e., "lead hand") in the agency who will be responsible for coordinating the implementation of *RESPs for Kids in Care* within the local CAS and who will be the main contact between the CAS and the research team.

- ✓ To determine which members of its direct-service and supervisory staff will be involved in the project.

- ✓ To nominate and enrol assenting young people in the CAS's care who satisfy the following criteria:

    1. Aged approximately 9-12 years and in grades 4, 5, 6, or 7 (in the 2008-2009 school year)
    2. Assessed and nominated by the child's child welfare worker and supervisor as likely to benefit from foster parent tutoring
    3. Neither a very strong nor an extremely weak nor an extremely behaviourally disturbed student (as assessed by the child welfare worker and supervisor)
    4. Fluent in English (as the instructional materials for the educational intervention exist only in English)
    5. Resident in a foster home or kinship care home (but not a group home), whether run by the local CAS or by a private provider
    6. In a stable placement (as assessed by the child welfare worker and supervisor)
    7. Either a Crown Ward or Society Ward, and thus likely to remain in the study
    8. The child gives his or her informed assent to participate in the study
    9. Participation in the study will be limited to one foster child per home (as nominated by the CAS), to limit the burden on the foster parent (who may have up to four foster children in the home).

- ✓ To nominate and enrol consenting foster parents or kinship caregivers who satisfy the following criteria:

    1. Assessed and nominated by their local CAS as sufficiently motivated and literate to function as tutors
    2. Ability to read well
    3. Willing to undergo a day of tutoring training
    4. Willing to have their tutoring performance monitored periodically
    5. Committed to tutor their foster child for 3 one-hour sessions per week during the school year and for 1 one-hour session during July and August
    6. Willing to collaborate with the child's child welfare worker in conveying the significance of the RESP to the child as an important investment in his or her future
    7. Has access to a computer and the Internet in the home (to run the computer-based mathematics software and to communicate regularly with the project staff via e-mail).

- ✓ To open a Registered Education Savings Plan (RESP) for each young person who participates in either intervention. This will entail making a deposit of $500 for each child in each of the two project years (2008-2009 and 2009-2010), which will enable the young person to receive the maximum $200 (40%) match from the federal government each year.

- ✓ To collaborate with the research team with training and assessment (pre-test, post-test and follow-up) activities related to the interventions.

- ✓ To make available meeting rooms in the CAS to conduct training sessions and assessments related to the interventions.

- ✓ To provide descriptive information on the participating children (for example, on the services or medications received by the children during the study, etc.).

- ✓ To make available for training those members of the CAS staff, foster parents or kinship caregivers who will participate in the project and to cover their costs of travel to the training locations, which will be as close as possible to the CAS.

- ✓ To share the cost with the project of purchasing the foster parent tutoring materials, namely, the *Teach Your Children Well* learning materials developed by author of the Teach Your Children Well method and his colleagues at the Quinte Learning Centre in Belleville, Ontario. These materials will be used by the foster parents or kinship caregivers to tutor the one foster child per home who will be a participant in the project. The estimated average cost per child to the CAS over the 20 months of the intervention will be $135.

- ✓ To cover the costs of travel for the project lead hand to occasional lead hands meetings, which are likely to be held in Toronto. As many meetings as possible will be conducted through teleconferences, to limit travel costs. The first lead hands meeting will be held on September 4, 2008, from 10:00 a.m. to 3:00 p.m. at the Ontario Association of Children's Aid Societies (room 309), in Toronto.

- ✓ To consent to the use for publication and educational purposes of *aggregated* (i.e., anonymous) data related to individual participants in the research, in conformity with the guarantees of anonymity and confidentiality required by the Research Ethics Board of the University of Ottawa.

Responsibilities of the RESPs for Kids in Care Research Team

For its part, the research team agrees to provide the following to the local CAS:

- ✓ Ethics approval of the project from the Research Ethics Board at the University of Ottawa before any individual children in care are enrolled.

- ✓ Randomization of the young people selected by the local CAS, with their foster parents or kinship caregivers, to one of the two interventions described above (as noted earlier, those assigned to the RESP intervention will receive the educational intervention in the second 10-month intervention period).

- ✓ Initial training sessions, on a regional basis, for all participating CAS staff, foster parents or kinship caregivers, in order to ensure that interventions and data collection are carried out in a consistent manner.

- ✓ Intervention manuals that will include detailed procedures for implementing the interventions in a consistent manner.

- ✓ Coverage of part of the cost of author of the Teach Your Children Well method's *Teach Your Children Well* learning materials (i.e., the project will pay for Level 1 and the math software).

- ✓ Assessment instruments at pre-test, post-test and follow-up that will be administered and scored by the project research team.

- ✓ Coverage of the costs of training, travel, and ongoing coaching and consulting by author of the Teach Your Children Well method and his colleagues at the Quinte Learning Center, to implement the foster parent tutoring intervention with a high degree of fidelity. This will include a 1-800 Tutor Hotline, newsletters and teleseminars.

- ✓ Management and analysis of data.

- ✓ Troubleshooting to the local CAS throughout the field trial phase (2008-2010) of the project, by the project coordinator and author of the Teach Your Children Well method and colleagues at the Quinte Learning Center.

- ✓ Interim and final reports that will consist of study evaluations, collected data, key outcomes, and recommendations.

- ✓ Assurance that only *aggregated* (i.e., anonymous) data related to individual participants in the research will be reported, in conformity with the guarantees of anonymity and confidentiality required for approval of the project by the Research Ethics Board of the University of Ottawa.

- ✓ Assurance that CASs that participate will not be named in publications unless they request to be identified.

We, the research team, wish to thank the local CAS for agreeing to participate in what we hope is a groundbreaking project. We look forward to working with you to make a very significant contribution to the field of child welfare in Ontario and elsewhere.

Signatures, on behalf of the local Children's Aid Society:

Executive Director_____

Date _____

Signature, on behalf of the RESPs for Kids in Care project:

Principal Investigator_____

Date_____

Project research team members:

Robert J. Flynn, PhD, Project Principal Investigator
University of Ottawa
Co-founder and Director of the Centre for Research on Educational and Community Services

Tim Aubry, PhD, Project Co-Investigator
University of Ottawa
Co-founder and Senior Researcher at the Centre for Research on Educational and Community Services

Robyn Marquis, Graduate Student, Project Co-Investigator
University of Ottawa
Center for Research on Educational and Community Services

Marie-Pierre Paquet, Project Coordinator
University of Ottawa
Centre for Research on Educational and Community Services

Appendix G

Recruitment Text for Foster Children and Foster Parents

Recruitment Text for Young Person

Dear young person,

You are invited to participate in a study, *RESPs for Kids in Care*. This study is being done by Robert Flynn and his team at the University of Ottawa. The study wants to learn about ways to improve the school success of young people in care, since education is very important for their future. The study will last for 2 years, from October, 2008, to July, 2010.

As part of the study, Children's Aid Societies (CASs) will open and deposit money in Registered Education Savings Plans (RESPs). RESPs are accounts at the bank that allow people to save money to help pay for a young person's education after high school. Another part of the study is to see how tutoring by foster parents and kinship caregivers can help a young person like you to improve their reading and math skills.

Your CAS and foster parents (or kinship caregivers) have to say it's OK for you to be in the study. After they decide, you get to choose if you want to be in the study. If you don't want to be in the study, no one will be mad at you. If you want to be in the study now and change your mind later, that's OK. You can stop at any time.

If you decide to participate in the study, you will need to sign an "assent" form.

Yours sincerely,

Robert J. Flynn, Ph.D., C. Psych.
Principal Investigator

Marie-Pierre Paquet, B.A.
Project Coordinator

Robyn Marquis, M.Ed., Ph.D. Candidate
Research Assistant

FOSTER PARENT AND KINSHIP CAREGIVER RECRUITMENT SCRIPT

Dear Foster Parent or Kinship Caregiver,

We are researchers at the University of Ottawa who are working in collaboration with your local Children's Aid Society (CAS) on a study, *RESPs for Kids in Care*. The study is intended to address the problem of poor educational outcomes among young people in care. The study will test the relative effectiveness of two interventions to improve educational outcomes and social behavior among young people in care. The two interventions to be tested are, respectively, (1) a Registered Education Savings Plan (RESP), with an appropriate orientation for foster parents and kinship caregivers; and (2) the RESP/orientation, plus training in educational tutoring for foster parents and kinship caregivers. The study will last for 2 years, from October, 2008, to July, 2010.

The young people in care who participate in the study will be randomly assigned to one of the two interventions described above. The young people who do not receive tutoring from their caregivers in 2008-2009 will receive it 2009-2010.

To participate in the project, you will need to agree to convey the significance of the RESP to your foster or kinship care child (or children) as an important investment in their future. You will also need to agree to participate in one day of training in the educational tutoring method developed by Teach Your Children Well. You will need to commit to tutoring your foster or kinship care child (or children) for 3 hours per week during the 2008-2009 and/or 2009-2010 school year(s), depending on which intervention group you and your foster or kinship care child (or children) are assigned to. *(Note that tutoring must be administered to each child individually. Thus, if you have two children participating in the study, you will be required to provide 3 hours of tutoring to each child.)* You will also need to agree to have your tutoring performance monitored regularly, to make sure that you are applying the methods that you have learned. To participate in the study, you will require access to a computer in your home to run the computer-based mathematics software, as well as access to telephone, fax or email to communicate regularly with the project staff.

To participate in the project, you will need to agree to provide information on your foster or kinship care child (or children) by completing the Conners' questionnaire, which consists of 26 items and takes 5-10 minutes to complete, and the Child Behavior Checklist, which consists of 120 items and takes 15-20 minutes to complete. These questionnaires will need to be completed at three occasions during the project (at pre-test, post-test and follow-up).

We would appreciate your consenting to participate in our study. If you agree to take part, you will be asked to sign two copies of the consent form, one for you to keep and one for the researchers.

Your participation is strictly voluntary and you are free to refuse to participate or to withdraw from the study at any moment. If you refuse to participate in the study, the services that you and your foster or kinship care child (or children) receive from your local CAS will not be affected in any way.

Thank you for reading this material. We really appreciate your help. If you have any questions about this study, you may contact the project coordinator, Ms. Marie-Pierre Paquet. If you have questions about the ethical aspects of the research or you wish to make a complaint about how it is being conducted, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, 550 Cumberland St, Room 160. Tel. (613) 562-5841;
Fax. (613) 562-5318; e-mail ethics@uottawa.ca.

Yours sincerely,

Robert J. Flynn, Ph.D., C. Psych.
Principal Investigator

Marie-Pierre Paquet, B.A.
Project Coordinator

Robyn Marquis, M.Ed., Ph.D. Candidate
Research Assistant

Appendix H

RESP Information Handout

A Great Opportunity to Help Your Child Do Better in School

Registered Education Savings Plans (RESPs)
RESPs are special savings account that help save early for a child's education after high school. The Government of Canada allows savings for education to grow tax free until the child named in the RESP enrolls in education after high school.
Anyone (including a parent, foster parent, grandparent, other relative, or friend), can open an RESP for a child. As part of this study, your local Children's Aid Society will open an RESP for each participating child and deposit $500 for each of the two study years.

An extra $200 from the Government of Canada
The Government of Canada will match the $500 placed by the CAS in the child's RESP with an additional $200 (i.e., a match of 40%). This match is called the Canada Education Savings Grant (CESG).

For more information, please consult the brochures "RESPs: A Special Savings Plan for Education" and "Get Money Now For Your Child's Education After High School", or visit www.canlearn.ca.

The RESPs for Kids in Care Project

Dear foster parent or kinship caregiver,

As part of this study, we are asking you to convey the significance of the RESP to each child in your home who is participating in the study as an important investment in his or her future.

To communicate this message clearly to each participating child, we are asking you to do the following:

1. Place the Canada Education Savings Program (CESP) piggy bank and growth chart in visible areas in your home. These can be used as tools to begin conversations with the child about his or her RESP and to convey the expectation that he or she will pursue post-secondary education.

2. Communicate <u>at least once per week</u> the essence of the following message:

   "[Child's name], you are valued and important. Education is a key to your future. That is why your CAS is setting money aside for you in the bank to pay for your education after high school. You have a great future ahead of you, and this money will help you continue your studies so that you can achieve your dreams."

3. Report every mid-month (around the 15th) to Marie-Pierre Paquet, the project coordinator, how often your have transmitted the essence of the above message clearly and explicitly to each child in your home participating in the study. Marie-Pierre will send out a reminder, asking you to answer the following question, either by email or by telephone:

   *During the last 4 weeks, how many times have you communicated the essence of the following message **[see above]** clearly and explicitly to your foster child? Please choose one of the following answers:*

   a) less than once per week
   b) about once per week
   c) several times per week
   d) daily

By choosing to participate in the project, you are playing an important role in helping your child do better in school. You are also helping us gain knowledge about effective ways to address the educational difficulties of children in out-of-home care. If you have any questions at any time during the study, or if you require more information, please contact:

Marie-Pierre Paquet, Project Coordinator
Centre for Research on Educational and Community Services
University of Ottawa

Appendix I

Teach Your Children Well Tutoring Program Handout

A Great Opportunity to Help Your Child Do Better in School

The ***Teach Your Children Well*** method is based on direct instruction, a proven educational approach that uses a well-organized instructional methodology and clearly structured teaching materials. Its aim is to accelerate the learning of educationally disadvantaged children in reading, language, and arithmetic through learning intelligent behaviour, not rote memorization.

The author of Teach Your Children Well will train the participating foster parents and kinship caregivers in the tutoring method in one-day workshops shortly before the beginning of the intervention. He and his colleagues will also provide ongoing consultation to foster parents and kinship caregivers during the study.

The RESPs for Kids in Care Project

Dear foster parent or kinship caregiver,

You have been randomly assigned to the intervention group of this study. This means that in 2008-2009 you will begin tutoring, in reading and math, each child in your home who is participating in the study. You will continue with the child (or children) in 2009-2010.

To ensure that the tutoring you provide to your child (or children) meets the guidelines of the Teach Your Children Well method, we are asking you to do the following:

1. Participate in one day (6 hours) of training in educational tutoring offered by the author of the Teach Your Children Well method. **Please consult the attached schedule to know when and where the training will take place in your area.**

2. Apply this tutoring method with your child (or children) for a total of 3 hours per week per child for 30 weeks during the 2008-2009 school year and again in 2009-2010. (*Note that tutoring must be administered to each child individually.)* These 3 hours per week will include 2 hours of instruction, one-on-one with the child, using an instructor's manual which offers step by step procedures. Most of the instruction will focus on reading, but some instruction time will also be spent by the child working independently on the computer with the math software. Also, the 3 hours of weekly tutoring will include 1 hour of practice by the child, guided by you as the tutor.

3. Send the child's performance data for each tutoring session at the end of each week to the Teach Your Children Well office, via telephone, fax, or e-mail. This will allow the educational consultants and the research team to track the child's progress. This will be covered as part of your training with Teach Your Children Well.

4. Receive on-going coaching and get answers to your questions by communicating regularly with Teach Your Children Well staff. To facilitate regular communication, a toll-free Tutor Hotline (1-877-368-1513) will be available to you, together with monthly teleseminars and newsletters.

By choosing to participate in the project, you are playing an important role in helping your child do better in school. You are also helping us gain knowledge about effective ways to address the educational difficulties of children in out-of-home care. If you have any questions relating to the educational tutoring part of the study, please contact:

Author of the Teach Your Children Well method, Educational Consultant
Teach Your Children Well
Tel. 1-877-XXX-XXXX (toll-free), Fax. 613-XXX-XXXX
Email.

For any other questions about the study, please contact:

Marie-Pierre Paquet, Project Coordinator

APPENDIX J

Educational Results

WRAT4 Results

The assumption of equality of covariance was met in most analyses; in the cases where it the analyses indicated that there may be concerns of inequality, the null hypothesis was rejected based upon the guidelines outlined by Tabachnick and Fidell (2007), which state that the outcome of Box's M test can be disregarded if the samples sizes are relatively even and if Box's M is not significant at $p < .001$ (p. 252). In the current study, both criteria were met and thus equality of covariances was assumed in all cases/analyses.

Word Reading. None of the between-subjects results were significant (see Table A1), although the group-by-gender interaction was almost so ($p = .112$). Of the within-subject

Table A1.

Repeated-Measures ANOVA for WRAT4 Word Reading Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	100.16	1	100.16	.27	.605	.00
Gender	358.58	1	358.58	.97	.329	.02
Group*Gender	958.69	1	958.69	2.60	.112	.04
Error	22168.91	60	369.48			
Within Subjects:						
Time	157.56	1	157.56	4.63	**.035**	.07
Time*Group	55.40	1	55.40	1.69	.207*	.02
Time*Gender	72.01	1	72.01	2.12	.151	.03
Time*Group*Gender	48.17	1	48.17	1.42	.239	.02
Error	2040.54	60	34.01			

* all *p*-values for group-by-time interactions associated with the WRAT4 results presented in the following tables remain two-tailed, despite the one-tail reference in the text; according to Ley (1979), a directional *F*-test of $p = .10$ is equivalent to one-tailed *t*-test of $p <$ tail of .05 for *t*-tests.
Note: all Eta^2 values reported herein were calculated using the formula presented by Pierce et al. (2004).

findings, there was a statistically significant effect ($p < .035$) for time, indicating that over the course of the intervention year, the participants in both the experimental and control group made significant gains in their word-reading skills.

Sentence Comprehension. On this subscale, the between-subject differences were not statistically significant for group and gender (Table A2). However, there was a group-by-gender interaction at the level of a trend ($p = .073$). Among the within-subject results, there was a significant effect for time ($p < .001$) and a trend-level effect for the group-by-time interaction ($p = .092$).

Table A2.

Repeated-Measures ANOVA for WRAT4 Sentence Comprehension Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	433.24	1	433.24	1.50	.225	.02
Gender	322.53	1	322.53	1.12	.295	.02
Group*Gender	962.69	1	962.69	3.33	.073	.05
Error	17324.54	60	288.74			
Within Subjects:						
Time	486.67	1	486.67	17.18	**.000**	.21
Time*Group	83.00	1	83.00	2.93	**.092**	.04
Time*Gender	34.70	1	34.70	1.23	.273	.02
Time*Group*Gender	19.77	1	19.77	0.70	.407	.01
Error	1699.75	60	28.33			

Reading Composite. The between-group differences were not statistically significant for group and gender (Table A3). However, there was a trend-level group-by-gender interaction ($p = .078$). The within-subject analyses indicated a significant effect for time ($p < .001$) and a trend-level effect for the time-by-group interaction ($p = .079$).

Table A3.

Repeated-Measures ANOVA for WRAT4 Reading Composite Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	287.84	1	287.84	0.84	.365	.01
Gender	417.63	1	417.63	1.21	.275	.02
Group*Gender	1104.82	1	1104.82	3.21	.078	.05
Error	20686.14	60	344.77			
Within Subjects:						
Time	353.82	1	353.82	15.67	**.000**	.20
Time*Group	71.97	1	71.97	3.19	**.079**	.04
Time*Gender	1.75	1	1.75	0.78	.782	.00
Time*Group*Gender	1.09	1	1.09	0.48	.827	.00
Error	1354.48	60	22.58			

Spelling. None of the between-subjects results were statistically significant (Table A4). However, there was a significant effect for time ($p < .025$) and a trend-level time-by-group interaction ($p = .081$) at the within-subjects level.

Table A4.

Repeated-Measures ANOVA for WRAT4 Spelling Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	44.85	1	44.85	0.11	.746	.00
Gender	163.45	1	163.45	0.39	.537	.01
Group*Gender	585.75	1	585.75	1.38	.244	.02
Error	25437.22	60	423.95			
Within Subjects:						
Time	87.03	1	87.03	5.26	**.025**	.08
Time*Group	51.94	1	51.94	3.14	**.081**	.05
Time*Gender	9.74	1	9.74	0.59	.446	.01
Time*Group*Gender	3.55	1	3.55	0.21	.645	.00
Error	992.38	60	16.54			

Math. There were no statistically-significant between-subject effects for group or gender (Table A5). Of the within-subjects results, there was only a tend-level time-by-group interaction (p = .101).

Table A5.

Repeated-Measures ANOVA for WRAT4 Math Computation Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	488.40	1	488.40	2.16	.147	.04
Gender	87.42	1	87.42	0.39	.536	.01
Group*Gender	16.74	1	16.74	0.07	.786	.00
Error	13556.29	60	225.94			
Within Subjects:						
Time	337.22	1	337.22	10.01	**.002**	.14
Time*Group	93.66	1	93.66	2.78	**.101**	.04
Time*Gender	17.26	1	17.26	0.51	.477	.01
Time*Group*Gender	6.09	1	6.09	0.18	.672	.00
Error	2020.83	60	33.68			

APPENDIX K

Mental Health Results

As with the educational results, the assumption of equality of covariance, as indicated by Box's *M*, was assumed for all mental health measures based upon the same criteria outlined by Tabachnick and Fidell (2007).

Conners' ADHD/DSM-IV Parent Rating Scales (CADS-P)

ADHD Index score. The only between-subject difference that was statistically significant was gender ($p < .03$; see Table A6). None of the within-subject differences were statistically-significant.

Table A6.

Repeated-Measures ANOVA for Conners' ADHD/DSM-IV Scale- Parent version ADHD Index Score ADHD Index Score.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	146.85	1	146.85	0.55	.460	.01
Gender	1359.44	1	1359.44	5.12	**.027**	.08
Group*Gender	261.08	1	261.08	0.98	.325	.02
Error	15926.63	60	265.44			
Within Subjects:						
Time	16.53	1	16.53	0.35	.559	.00
Time*Group	0.26	1	0.26	0.01	.942	.00
Time*Gender	24.67	1	24.67	0.51	.476	.01
Time*Group*Gender	30.66	1	30.66	0.64	.427	.01
Error	2876.56	60	47.94			

Child Behavior Checklist (CBCL)

Internalizing subscale. No between-subject differences were statistically significant for group or gender (Table A7). Time was the only significant within-subjects variable ($p < .05$).

Table A7.

Repeated-Measures ANOVA for Child Behavior Checklist Internalizing Subscale .

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	183.00	1	183.00	0.81	.371	.01
Gender	39.99	1	39.99	0.17	.675	.00
Group*Gender	250.44	1	250.44	1.11	.296	.02
Error	13541.54	60	255.69			
Within Subjects:						
Time	140.58	1	140.58	4.06	**.048**	.06
Time*Group	1.79	1	1.79	0.52	.821	.00
Time*Gender	43.71	1	43.71	1.26	.265	.02
Time*Group*Gender	11.17	1	11.17	0.32	.572	.01
Error	2075.56	60	34.59			

Externalizing subscale. The results for the Repeated-Measures ANOVA are presented in Table A8. None of the between- or within-subjects effects were statistically significant for either group of children.

Table A8.

Repeated-Measures ANOVA for the Child Behavior Checklist Externalizing Subscale.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	178.41	1	178.41	0.79	.379	.00
Gender	114.01	1	114.01	0.50	.481	.00
Group*Gender	15.13	1	15.13	0.07	.797	.00
Error	13637.98	60	227.30			
Within Subjects:						
Time	28.10	1	28.10	0.91	.344	.01
Time*Group	34.81	1	34.81	1.13	.293	.02
Time*Gender	63.26	1	63.26	2.05	.158	.03
Time*Group*Gender	5.54	1	5.54	0.18	.674	.00
Error	1854.94	60	30.92			

Self-Perception Profile for Children (SPPC)

As a consequence of the one-time administration of this measure, only between-group effects are reported. The results indicated that there were no statistically significant effects for group or gender (Table A9).

Table A9.

ANOVA for the Self-Perception Profile for Children Academic Self-Perception Subscale.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	28.45	1	28.45	1.79	.186	.03
Gender	20.49	1	20.49	1.29	.260	.02
Group*Gender	0.82	1	0.82	0.05	.821	.00
Error	952.04	60	15.87			
Total	17677.00	64				

Alabama Parenting Questionnaire (APQ)

As a consequence of the one-time administration, there are no within-subjects results to report for either the Positive Parenting or Parental Involvement subscales of this questionnaire.

Positive Parenting subscale: Foster children and foster parents' responses. The foster children's responses on this subscale yielded statistically nonsignificant results for the between-subject effects (see Table A10).

Table A10.

ANOVA for Foster Children's Responses on the Alabama Parenting Questionnaire Positive Parenting Subscale.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	0.02	1	0.02	0.00	.978	.00
Gender	40.56	1	40.56	2.17	.146	.04
Group*Gender	4.00	1	4.00	0.21	.645	.00
Error	1083.57	58	18.68			
Total	38151.00	62				

In contrast to the children's responses, the foster parents' responses on their parallel version of this subscale indicated statistically significant effects at the between-subjects level for both group ($p < .006$) and gender ($p < .034$) (see Table A11).

Table A11.

ANOVA for Foster Parents' Responses on the Alabama Parenting Questionnaire Positive Parenting Subscale.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	60.38	1	60.38	8.14	**.006**	.09
Gender	34.92	1	34.92	4.71	**.034**	.05
Group*Gender	17.69	1	17.69	2.38	.128	.03
Error	430.48	58	7.42			
Total	42703.00	62				

Parental Involvement: Foster children and foster parents' responses. The foster children's responses on this subscale yielded a statistically significant between-subjects effect for group ($p < .052$; Table A12).

Table A12.

ANOVA for Foster Children's Responses on the Alabama Parenting Questionnaire Parental Involvement Subscale.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	159.48	1	159.48	3.93	**.052**	.06
Gender	43.53	1	43.53	1.07	.305	.02
Group*Gender	3.04	1	3.04	0.08	.785	.00
Error	2355.35	58	40.61			
Total	84944.00	62				

The foster parents' responses on their parallel version of this subscale indicated nonsignificant effects at the between-subjects level (see Table A13). However, there was a trend-level group-by-gender effect (p = .071).

Table A13.

ANOVA for Foster Parents' Responses on the Alabama Parenting Questionnaire Parental Involvement Subscale.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	38.00	1	38.00	1.85	.179	.03
Gender	8.01	1	8.01	0.39	.534	.01
Group*Gender	69.50	1	3.04	3.39	.071	.05
Error	1188.80	58	20.50			
Total	102256.00	62				

APPENDIX L

Implementation Fidelity: Foster Parents' Use of Program Supports

Use of Tutoring Supports by Foster Parents

As was also reported by Flynn et al. (2011), in the foster parent questionnaire, experimental group foster parents were asked to report on how often they used the different supports that were made available to them, either by the author of the *TYCW* tutoring program, the *RESPs for Kids in Care* project coordinator or their local CAS, to help them with the tutoring. These supports included monthly newsletters and teleseminars, a toll-free phone number to reach the author of the tutoring program or the project coordinator. A majority of the foster parents reported that, "most of the time", they submitted weekly data to the project coordinator (79%), read the correspondence sent by the project coordinator by email or regular mail (87%), and read the monthly newsletters (80%). However, few foster parents joined the monthly teleseminars (17%), or called the author of the tutoring program (17%) *or* project coordinator (14%) when they had a question or a problem. Moreover, a slight majority (52%) of the foster parents reported that they received "very little" support from their CAS in relation to the project.

Implementation of the Reward System and Obstacles to Implementation of Tutoring

Less than half (43%) of the foster parents reported that they used a reward system with their foster child while delivering the tutoring curriculum. Meanwhile, the foster child's display of difficult behaviour was identified by 57% of the foster parents as considerable obstacle to implementing the tutoring curriculum, followed closely by the child's resistance to doing the tutoring (reported by 40% of the foster parents). Other frequently reported obstacles included time demands of extracurricular activities (50% of foster parents) and the child having too much homework (reported by 40% of foster parents)

APPENDIX M

Moderation Analyses

CADS-P ADHD Index Score as a Moderator

The RMANOVA results indicated that time was the only within-subject significant effect, across all of the WRAT4 subtests ($p \leq .013$) except for Word Reading (*ns*). At the between-subjects level, the dichotomized level of ADHD was significant only for Sentence Comprehension ($p < .032$) (see Tables A14-A18).

Table A14.

Repeated-Measures ANOVA for Moderation Analyses: Conners' ADHD/DSM-IV Scale- Parent version ADHD Index Score "Level" on WRAT4 Word Reading Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	1.85	1	1.85	0.01	.945	.00
CADS-Lvl	254.47	1	254.47	0.66	.419	.01
Group*CADS-Lvl	88.22	1	88.22	0.23	.634	.00
Error	23074.22	60	384.57			
Within Subjects:						
Time	129.15	1	129.15	3.57	.064	.05
Time*Group	63.21	1	63.21	1.75	.191	.03
Time*CADS-Lv	0.01	1	0.01	0.00	.989	.00
Time*Group*CADS-Lvl	0.42	1	0.42	0.01	.915	.00
Error	2168.43	60	36.14			

Table A15.

Repeated-Measures ANOVA for Moderation Analyses: Conners' ADHD/DSM-IV Scale- Parent version ADHD Index Score "Level" on WRAT4 Sentence Comprehension Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	63.59	1	63.59	0.22	.638	.00
CADS-Lvl	1363.81	1	1363.81	4.79	**.032**	.07
Group*CADS-Lvl	114.30	1	114.30	0.40	.529	.01
Error	17067.86	60	17067.86			
Within Subjects:						
Time	416.81	1	416.81	14.81	**.000**	.18
Time*Group	103.96	1	103.96	3.69	.059	.05
Time*CADS-Lv	4.82	1	4.82	0.17	.681	.00
Time*Group*CADS-Lvl	64.41	1	64.41	2.29	.136	.03
Error	1688.75	60	28.15			

Table A16.

Repeated-Measures ANOVA for Moderation Analyses: CADS-P "Level" on WRAT4 Reading Composite Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	29.10	1	29.10	0.08	.775	.00
CADS-Lvl	870.02	1	870.02	2.47	.122	.04
Group*CADS-Lvl	96.37	1	96.37	0.27	.603	.00
Error	21162.84	60	21162.84			
Within Subjects:						
Time	297.57	1	297.57	13.33	**.001**	.17
Time*Group	87.48	1	87.48	3.92	**.052**	.05
Time*CADS-Lv	2.05	1	2.05	0.09	.763	.00
Time*Group*CADS-Lvl	15.85	1	15.85	0.71	.403	.01
Error	1339.66	60	1339.66			

Table A17.

Repeated-Measures ANOVA for Moderation Analyses: Conners' ADHD/DSM-IV Scale- Parent version ADHD Index Score "Level" on WRAT4 Spelling Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	140.02	1	140.02	0.33	.570	.00
CADS-Lvl	33.48	1	33.48	0.08	.781	.00
Group*CADS-Lvl	340.33	1	340.33	0.79	.377	.01
Error	25774.81	60	25774.81			
Within Subjects:						
Time	105.52	1	105.52	6.56	**.013**	.09
Time*Group	27.21	1	27.21	1.69	.198	.02
Time*CADS-Lv	25.68	1	25.68	1.60	.211	.02
Time*Group*CADS-Lvl	14.38	1	14.38	0.89	.348	.01
Error	965.07	60	965.07			

Table A18.

Repeated-Measures ANOVA for Moderation Analyses: Conners' ADHD/DSM-IV Scale- Parent version ADHD Index Score "Level" on WRAT4 Math Computation Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	359.95	1	359.95	1.64	.206	.03
CADS-Lvl	443.50	1	443.50	2.02	.161	.03
Group*CADS-Lvl	15.24	1	15.24	0.07	.793	.00
Error	13206.45	60	13206.45			
Within Subjects:						
Time	404.88	1	404.88	12.67	**.001**	.16
Time*Group	49.40	1	49.40	1.55	.219	.02
Time*CADS-Lv	101.53	1	101.53	3.18	.080	.04
Time*Group*CADS-Lvl	26.59	1	26.59	0.83	.365	.01
Error	1917.89	60	1917.89			

CBCL's Total Problems as a Moderator

According to the RMANOVA, at the within-subjects level, the effect for time was significant across all WRAT4 subtests ($p \leq .050$), with the exception of Reading Composite (*ns*). Furthermore, there was a time-by-group-by-CBCL Total Problems interaction ($p < .018$) for Sentence Comprehension (see Tables A19-A23).

Table A19.

Repeated-Measures ANOVA for Moderation Analyses: Child Behavior Checklist Total Problems "Level" on WRAT4 Word Reading Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	37.12	1	37.12	0.10	.758	.00
TP-Lvl	74.33	1	74.33	0.19	.663	.00
Group*TP-Lvl	39.76	1	39.76	0.10	.750	.00
Error	23294.10	60	23294.10			
Within Subjects:						
Time	135.79	1	135.79	3.79	.056	.06
Time*Group	69.49	1	69.49	1.94	.169	.03
Time*TP-Lvl	6.29	1	6.29	0.18	.677	.00
Time*Group*TP-Lvl	12.00	1	12.00	0.34	.565	.01
Error	2149.36	60	2149.36			

Table A20.

Repeated-Measures ANOVA for Moderation Analyses: Child Behavior Checklist Total Problems "Level" on WRAT4 Sentence Comprehension Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	282.45	1	282.45	0.92	.341	.02
TP-Lvl	86.40	1	86.40	0.28	.598	.01
Group*TP-Lvl	43.92	1	43.92	0.14	.706	.00
Error	18404.00	60	18404.00			
Within Subjects:						
Time	501.21	1	501.21	18.86	**.000**	.22
Time*Group	66.00	1	66.00	2.48	.120	.03
Time*TP-Lvl	12.44	1	12.44	0.47	.496	.01
Time*Group*TP-Lvl	155.84	1	155.84	5.86	**.018**	.07
Error	1594.57	60	1594.57			

Table A21.

Repeated-Measures ANOVA for Moderation Analyses: Child Behavior Checklist Total Problems "Level" on WRAT4 Reading Composite Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	160.10	1	160.10	0.43	.512	.00
TP-Lvl	0.59	1	0.59	0.00	.968	.00
Group*TP-Lvl	1.61	1	1.61	0.00	.948	.00
Error	22124.88	60	22124.88			
Within Subjects:						
Time	342.79	1	342.79	15.49	**.000**	.19
Time*Group	70.51	1	70.51	3.19	.079	.04
Time*TP-Lvl	14.00	1	14.00	0.63	.430	.01
Time*Group*TP-Lvl	17.97	1	17.97	0.81	.371	.01
Error	1327.47	60	1327.47			

Table A22.

Repeated-Measures ANOVA for Moderation Analyses: Child Behavior Checklist Total Problems "Level" on WRAT4 Spelling Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	69.91	1	69.91	0.17	.682	.00
TP-Lvl	1275.59	1	1275.59	3.09	.084	.05
Group*TP-Lvl	110.36	1	110.36	0.27	.607	.00
Error	24806.46	60	24806.46			
Within Subjects:						
Time	82.38	1	82.38	4.99	**.029**	.07
Time*Group	50.21	1	50.21	3.04	.086	.04
Time*TP-Lvl	0.88	1	0.88	0.05	.818	.00
Time*Group*TP-Lvl	13.74	1	13.74	0.83	.365	.01
Error	989.84	60	989.84			

Table A23.

Repeated-Measures ANOVA for Moderation Analyses: Child Behavior Checklist Total Problems "Level" on WRAT4 Math Computation Subtest.

Source	Type III SS	*df*	*MS*	*F*	*p*	Eta^2
Between Subjects:						
Group	503.50	1	503.50	2.22	.142	.00
TP-Lvl	40.03	1	40.03	0.18	.676	.05
Group*TP-Lvl	1.83	1	1.83	0.01	.929	.00
Error	13624.93	60	13624.93			
Within Subjects:						
Time	308.43	1	308.43	9.47	**.003**	.13
Time*Group	92.18	1	92.18	2.83	.098	.04
Time*TP-Lvl	80.73	1	80.73	2.47	.121	.03
Time*Group*TP-Lvl	13.53	1	13.53	0.42	.522	.01
Error	1955.24	60	1955.24			

Appendix N

Correlations Between the WRAT4 Subtests

Table A24.

Intercorrelation Matrix for the five WRAT4 Subscales.

Variables	1.	2.	3.	4.	5.
1. Word Reading	--				
2. Sentence Comprehension	.739†	--			
3. Reading Composite	.937†	.926†	--		
4. Spelling	.781†	.645†	.769†	--	
5. Math Computation	.422†	.510†	.495†	.497†	--

† $p < .000$