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Reading Deficits in Pregnant Teens: Implications for Policy and Practice

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READING DEFICITS IN PREGNANT TEENS: IMPLICATIONS
FOR POLICY AND PRACTICE

by

Jessica Menard

A Thesis
Submitted to the Faculty of Graduate Studies
through Psychology
in Partial Fulfillment of the Requirements for
the Degree of Master of Arts at the
University of Windsor

Windsor, Ontario, Canada

2010

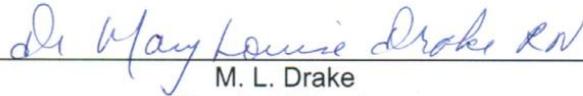
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Reading Deficits in Pregnant Teens: Implications for Policy and Practice

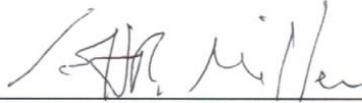
by

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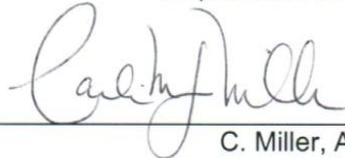
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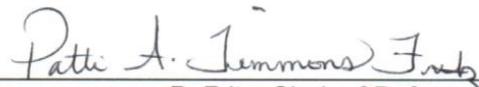
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ABSTRACT

The present study examined the relationship between teen pregnancy and reading achievement. Girls ages 14 to 17 who were pregnant at the time of testing (n = 3) and girls who had never been pregnant (n = 19) were compared on measures of reading achievement. Specifically, the WRAT-4 was used to measure lower-order single word reading and spelling skills, and the TOWRE and the NDRT were used to measure higher-order reading fluency and comprehension. A MANOVA was conducted to investigate whether there was a difference between pregnant and never-pregnant teens in one or more domains of reading achievement. Results did not indicate statistically significant differences between groups. Follow-up ANOVAs were conducted to compare pregnant and never-pregnant teens on measures of higher-order reading skills. No differences between groups were noted in any analysis. Due to small sample size, the power of the analyses was limited. Future research should be conducted with a larger sample.

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CHAPTER I

INTRODUCTION

Context of the Problem

Teen pregnancy is a significant social issue. The incidence of live births to teenage mothers in Canada is the 8th highest in the world (UNICEF, 2001), at a rate of 24.6 per every 1000 females in 2005 (Statistics Canada, 2008a). According to Statistics Canada, this statistic refers to live births, fetal losses (stillbirths, miscarriages, and illegal or unspecified abortions), and induced abortions. While the live birth rate to teenage mothers in Ontario is below the national average, even in Ontario girls under 20 years of age gave birth at a rate of 19.5 per every 1000 females in 2005 (Statistics Canada, 2008a). Within the Windsor-Essex County, the frequency of live births to teenage mothers is much higher than expected. At a rate of 26.0 live births per every 1000 females in 1996 (Windsor-Essex County Health Unit, 2000), the teen birth rate in the Windsor-Essex region exceeds both the national and provincial averages. Although not clearly substantiated by empirical studies, the hypothesized risk factors for elevated teen pregnancy rates in Windsor are numerous, including a less-than-ideal economy leading to high unemployment rates and high rates of economic deprivation, a strong local history of teen pregnancy, and few professional opportunities available locally.

In contrast with recent data from the United States (Hamilton, Martin, & Ventura, 2009), the incidence of teen pregnancies in Canada is believed to be in decline (McKay, 2006; Statistics Canada, 2000). This trend is thought to be due to the availability of contraceptives, as well as attempts to increase the average Canadian's awareness of the risks of unprotected sex (e.g., SOGC, 2000), and changes in sexual behaviour including

an increase in condom use by teens (Santelli et al., 2004). However, there is also evidence to suggest that the rate of teen pregnancy in Ontario is *higher* than it has been in the past. A report from Ontario Perinatal Surveillance System (OPSS; 2008) calculated the rate of pregnancy for girls 16 to 19 as being 3.5% of the population, or 35/1000 females. Whether the rates of teen pregnancy are increasing or decreasing, births to young mothers remain a legitimate concern, especially in the Windsor-Essex area. There are multiple negative consequences of both giving birth during the teenage years, and of being the child of a teenage mother. The short- and long-term effects of teenage pregnancy on mother and child will be discussed.

CHAPTER II

REVIEW OF LITERATURE

Organization of Review

This chapter begins by reviewing the long- and short-term effects of teen pregnancy on both the mother and the baby. This review is followed by a discussion of reading achievement as it relates to teen pregnancy. The process of learning to read and the importance of literacy are then described. Finally, an outline of the purpose of the current study, the research questions, and the hypotheses tested are given.

Short-Term Effects of Teen Pregnancy on the Mother

Most of the short-term effects on the mother relate to health problems associated with being pregnant. In terms of prenatal problems, researchers have found that adolescent mothers are more likely to suffer from gestational hypertension (high blood pressure; Konje, Palmer, Watson, Hay, & Imrie, 1992; Treffers, Olukoya, Ferguson, & Liljestrand, 2001), and pre-eclampsia (hypertension combined with proteinuria, edema, or both; Orvos et al., 1999; Saftlas, Olson, Franks, Atrash, & Pokras, 1990). In addition to being a problem in and of itself, hypertensive disorders of pregnancy (HDP) have been shown to have a negative effect on the psychosocial functioning of mothers who experience this complication (Rep, Ganzevoort, Bonsel, Wolf, & de Vries, 2007). This negative effect might be related to the added stress that a HDP adds on top the pregnancy itself, which is already a stressful situation for many women. Van Pampus and colleagues (2004) explain this relationship in terms of a diathesis-stress model, stating that “the stress caused by a complicated pregnancy and delivery can override coping mechanisms and lead to psychiatric complications” (p. 186). This point may be

especially applicable to pregnant teens, who are at greater risk for developing HDPs, and whose coping skills are likely less developed than those of adult women.

Another health risk that affects pregnant adolescents at a greater rate than adult women is anemia, which is a lower-than-average haemoglobin to blood volume ratio. An increase in the rate of anemia in teenage pregnancies was observed by Osbourne, Howat, and Jordan (1981), who reported a two-fold increase in the risk of anemia when comparing adolescent pregnant women to adults. Similarly, Jolly, Sebire, Harris, Robinson, and Regan (2000) and Konje and colleagues (1992) also found statistically significant differences between the rates of anemia in teenage and adult pregnant women. Further complications for the mother which are associated with anemia during pregnancy include preterm delivery, premature rupture of membranes, cardiac failure, cerebral anoxia, postpartum hemorrhage, and failure of lactation (Patra, Pasrija, Trivedi, & Puri, 2005).

Pregnant adolescents are also at a higher-than-average risk of experiencing perinatal problems. For example, Moerman (1982) concluded that immaturity of the still-growing pelvic bones of the adolescent mother may be a significant factor in obstetric risk in these young women. It has been suggested that immaturity of the pelvic bones can lead to complications involving cephalopelvic disproportion, which occurs when the baby's head or body is too big to fit through the mother's pelvis, as well as other dystocias (abnormal or difficult childbirth or labour; Harrison, Rossiter, & Chong, 1985; Moerman, 1982). Additionally, a higher risk for operative vaginal delivery (that which involves the use of forceps or a vacuum device) has been found for adolescent mothers (Conde-Agudelo, Belizán, & Lammers, 2005). On the other hand, it has been

consistently found that adolescent mothers are significantly less likely to be delivered of their babies by Caesarean-section (Al-Ramahi & Saleh, 2006; Lao & Ho, 1998; Leppert, Namerow, & Barker, 1986; Ziadeh, 2001). This finding might be due to the fact that peak bone density is not normally reached until the approximate age of 20 years, and that large increases in bone density happen across adolescence (Lloyd et al., 1993). Thus, since the bones of adolescent mothers are likely less dense than the bones of non-adolescent mothers, adolescents' bones might therefore be more malleable and better able to accommodate the passage of the child through the birth canal. However, another explanation for the lower incidence of c-sections in teenage mothers relates to the higher incidence of low birth weight babies in teenage pregnancies (Ziadeh, 2001), thereby reducing the need for delivery by c-section simply because the babies of teenage mothers tend to be smaller.

Long-Term Effects of Teen Pregnancy on the Mother

Although complications like hypertension, pre-eclampsia, and anemia which occur during pregnancy are considered to be short-term problems, such problems are also likely to have long-term consequences on the mother and baby. For example, Samuels-Kalow et al. (2007) found that HDP are associated with increased mortality rates for women who survive for more than 15 years post-pregnancy. Additionally, Callaway et al. (2007) concluded that HDP are associated with reported diagnosis of diabetes mellitus 21 years post-pregnancy. Third, Budden, Wilkinson, Buksh, and McCowan (2006) showed that maternal morbidity following pre-eclampsia was high, with participants developing HELLP syndrome (66%), renal impairment (26%), or requiring admission to the high dependency unit (74%), which is for patients who require more

extensive nursing care and monitoring than do patients on general wards, but less than those in intensive care. As for the outcome of the pregnancy, Budden and colleagues (2006) also found that none of the babies delivered to women with pre-eclampsia survived when delivered at a gestational age of less than 23 weeks, and only 62% of babies delivered to women with pre-eclampsia in the 24th week of gestation survived. Additionally, of the babies who did survive, 25% had moderate disability and 25% had minor disability, and all of the babies who survived had birthweights below the 5th percentile. Thus, given the finding that adolescent mothers are more likely to suffer from these problems to begin with, it follows that they are also more likely than adult mothers to suffer from long-term complications associated with these problems.

Becoming a mother at a very young age also has significant long-term effects on a young woman's psychosocial development. For example, becoming a parent as a teen is one of the most common reasons that teenage girls drop out of school, and the decision to drop out of school is directly related to the likelihood that mother and child will live in impoverished conditions (Strunk, 2008). In other words, if the mother does not complete her high school education, the chances that the child will be raised in poverty dramatically increase, as do the risk factors associated with poverty (Scaramella, Neppl, Ontai, & Conger, 2008).

As childbearing is the biggest contributor to dropout rates in teenage girls (Strunk, 2008), it follows that teenage mothers will also be less likely to go on to post-secondary education to acquire the skills needed for higher-paying jobs (Statistics Canada, 2008). As they are more likely to be working at low-skilled, low-paying jobs, teenage mothers are therefore also more likely to be living in the low income range. Furthermore, this

economic disadvantage has been found to be longstanding for these women, in that teenage mothers were more likely to be economically disadvantaged throughout their lives than women who delayed childbearing (Statistics Canada, 2008). Similarly, Olausson, Haglund, Weitoft, and Cnattingius (2001) also found that adolescent mothers had significantly increased odds of unfavourable socioeconomic outcomes such as low educational attainment, single living arrangements, high parity, collecting a disability pension, and welfare dependency, in later life. This is probably because the acquisition of job-related skills and significant wage increases are usually concentrated at the start of one's career (Statistics Canada, 2008), a time for teenage mothers when the well-being of their babies is likely a more immediate concern than are work-related matters.

Short-Term Effects of Teen Pregnancy on the Baby

One commonly seen poor outcome for babies born to teenage mothers is low birth weight for gestational age (LBW; Statistics Canada, 2000; Strunk, 2008), defined by the World Health Organization (2004) as an infant whose weight at birth is less than 2500g and very low birth weight (VLBW) as an infant born at a weight less than 1500g. Fraser, Brockert, and Ward (1995) found that there is an increased incidence of LBW in infants of adolescent mothers as compared to mothers in their twenties. Similarly, Cooper et al. (1995) compared younger adolescents (10 – 14 years of age) to older adolescents (15 years of age), finding that LBW was more common in the infants of younger adolescent mothers. The incidence of LBW presents a huge problem for teenage mothers and their babies, given the finding that infants with LBWs and VLBWs tend to have elevated rates of morbidity and mortality (Hack et al., 1991; McCormick, 1985).

Another problem often related to low birth weight in teenage pregnancies is preterm birth. Preterm birth is defined by the World Health Organization (2004) as birth that occurs before 37 completed weeks of gestation. The finding that there is a connection between teenage pregnancy and preterm birth has been fairly well replicated. For example, Cooper et al. (1995) found that the proportion of preterm (33-36 weeks gestation) and very preterm births (< 33 weeks gestation) was very high in adolescents and decreased significantly as maternal age increased. Controlling for living conditions, educational attainment, and antenatal care, Fraser et al. (1995) found that adolescent mothers had a significantly higher risk of preterm delivery and LBW babies than did non-adolescent mothers, thus supporting young age as an independent factor in preterm delivery. Buitendijk, Van Enk, Oosterhout, and Ris (1993) and Olausson, Cnattingius, and Haglund (1999) showed that the rates of very preterm birth were inversely related to maternal age, and that the youngest age groups run the highest risk of giving birth prematurely.

A slightly different measure of age at the time of childbirth is gynaecological age (GA), which is defined as a woman's chronological age minus her age at menarche (Zlatnik and Burmeister, 1977). Scholl, Hediger, Salmon, Belsky, and Ances (1989) found that low GA (less than two years) was associated with an almost two-fold increase in the risk of preterm birth and low birth weight. Hediger, Scholl, Schall, and Krueger (1997) also found that women with low GA were more likely to be at risk for preterm labour and delivery.

A third problem associated with teenage pregnancy are the high rates of intrauterine, perinatal, neonatal, and infant mortality. Intrauterine fetal death (IUFD)

involves the death of the fetus while still in the uterus. Perinatal mortality (PM) is defined as a stillbirth which involves the delivery of a non-living child with a gestational age of greater than 20 weeks or a birth weight of greater than 500 grams. Neonatal mortality (NM) involves the mortality of a newborn within the first week following birth, and infant mortality (IM) is defined as the mortality of liveborn infants within the first year of life (World Health Organization, 2004). Buitendijk et al. (1993) found that the babies of teenage mothers were at a significantly increased risk of IUFD, as compared to those of mothers aged 20 – 29 years. Further studies have shown increased rates of PM among the babies of adolescent mothers, as compared to those of older mothers (Rahman, Nessa, Rahman, Ali, & Ali, 1989; Ward & Biggs, 1981). Additionally, Cooper et al. (1995) found that children of the youngest mothers (aged 10 – 13 years) were at the greatest risk of NM. Similarly, in a comparison of women aged 13 – 24, Olausson et al. (1999) found that the rate of NM was almost three times higher for the babies of mothers aged 13 – 15 years than for mothers aged 20 – 24 years, and that the children of mothers aged 16 – 17 showed a 70% increase in the risk of neonatal mortality. No evidence was found to suggest that the rates of IM are increased for the babies of adolescent mothers.

Long-Term Effects of Teen Pregnancy on the Baby

It has been shown that the children of teenage mothers more often experience developmental disabilities, and more frequently require special education services later on in life (Gueorguieva et al., 2001), but that this trend disappears once other risk factors associated with teen pregnancy (e.g. maternal education, marital status, race, and poverty level) are considered. However, it has also been shown that the children of teenage mothers tend to present with lower general academic aptitude, and that they also have

lower educational aspirations (Card, 1981). Being born to a teenage mother can also negatively affect the psychosocial development of a child, as evidenced by the finding that children of adolescent mothers scored lower on a test of language development, and their mothers reported higher rates of behavioural problems than did older mothers (Buvinic, 1998).

Another long-term problem associated with being the product of a teenage pregnancy is the possibility for abuse by the parents that is related to the frustration and lack of knowledge associated with parenting (Strunk, 2008). Research also shows that being born to a teenage mother is related to an increased risk of domestic violence, substance abuse, depression, and homelessness (Berenson, San Miguel, & Wilkinson, 1992). Additionally, Buvinic (1998) showed that the nutritional status of the children of teenage mothers was significantly poorer four to ten years after birth than the children of adult mothers. In a study of children whose diets were assessed at six and twelve months, it was found that those children whose diet in infancy was characterized by high consumption of fruits, vegetables, and home-prepared foods had higher Full Scale and Verbal IQ scores and better memory performance at age four (Gale et al., 2009). The investigators suggested that dietary patterns in early life may have some effect on cognitive development, thus making poor nutritional status for the children of teenage mothers a very important issue.

Finally, teenage parenting is of particular concern because of its cyclical nature. It appears that teenage motherhood is a repetitive cycle that affects the likelihood that the children of teenage parents will end up in the same situation themselves (Statistics Canada, 2008). For example, one study found that daughters of teenage mothers were

66% more likely to become teenage mothers themselves, even after accounting for other risks such as school performance, depression, substance use, maternal education, parental marital status, and parental monitoring (Meade, Kershaw, & Ickovics, 2008). Another study found that the sisters of teenage child bearers also tend to show elevated rates of early child bearing (Friede et al., 1986). Furthermore, the daughters of mothers who were married at an early age tend to also marry young (Burton, 1996). Additionally, drug use, which has also been shown to demonstrate a cyclical intergenerational pattern (Johnson, Shontz, & Locke, 1984) is also linked to a higher risk of teen pregnancy (Mensch & Kandel, 1992). The fact that it affects not only one mother and her children, but also immediate family members and subsequent generations, makes teen pregnancy an especially important issue which deserves further attention.

Reading Skills as Related to Teen Pregnancy

Another factor which shows a cyclical intergenerational pattern is reading skills (Pennington, 1990). The issue of main concern here relates to the reading and literacy skills of those teens who become pregnant. It has been shown that previously pregnant young women show a greater reading delay than their never-pregnant peers (Matson & Haglund, 2000). Matson and Haglund (2000) also showed that students who did not regularly attend school had greater reading delays than those who did attend regularly. It follows that because teenage pregnancy is one of the leading contributors to drop-out rates (Strunk, 2008), teens who become pregnant are less likely to be regular attenders at school, thus exacerbating the reading problems they may already be facing. These reading problems might in turn affect the outcome of the pregnancy. Specifically, Arnold et al. (2001) showed that reading level was related to knowledge regarding the adverse

health effects of smoking cigarettes, and women with better reading skills were more concerned about how tobacco would affect themselves and their babies. Furthermore, it has been shown that the offspring of mothers who were less than 18 years of age when they gave birth also present with below-average reading skills (Shaw, Lawlor, & Najman, 2006). Thus, the relationship between the reading level of pregnant teens and the long-term outcomes of their offspring is an important area to be addressed through public policy initiatives.

What is Reading?

Learning to read has most often been conceptualized as being a step-wise process. Chall's (1983) five-step model of the development of reading proposes that reading occurs in discrete stages that are qualitatively distinct (Kaplan & Walpole, 2005). Chall posits that in the beginning stages of reading (ages 6 to 7), the child must learn the letter-sound relationships (a process which requires increasing proficiency in phonological processing and phonological awareness) in order to decode printed words. Then in the second stage (ages 7 to 8), decoding fluency is gained through practice. The third stage of reading development (ages 9 to 13) marks the transition from "learning to read" to "reading to learn." It is at this point that the child begins to acquire a store of background information and a growing vocabulary by reading a wide variety of materials. In stage four (ages 14 to 18), this knowledge is compared and evaluated, and finally, stage five reading (ages 18 and up) involves the synthesis of information and the formation of advanced-level hypothetical thinking. Snider and Tarver (1987) specify that each stage is dependent on the mastery of the previous one. Therefore, although the participants in the current study are expected to have mastered letter-sound relationships and decoding

skills, pregnant teens who experience pre-existing reading problems or those problems which come from sporadic school attendance or dropping out entirely may never reach the later stages of reading achievement as outlined in Chall's (1983) model.

Why is Literacy Important?

It has been shown that literacy skills are related to individuals' labour market outcomes. According to Statistics Canada (2006), functional literacy is positively correlated with working full-time, being employed over the last 12 months, and being currently employed. These researchers also found that for Canadian high school drop-outs, who tend to have very low functional literacy scores, literacy and numeracy skills do in fact have significant effects on individuals' labour market outcomes. Rivera-Batiz (1992) also found that quantitative literacy skills are a major factor related to the likelihood of obtaining full-time employment, and Meadows and Metcalf (2008) suggest that participation in adult literacy programs increases employability. Further, Rivera-Batiz (1990a; 1990b) also found that basic literacy skills and reading proficiency significantly affect wage constraints in individuals who lack these assets. Thus, given the finding that childbearing is the biggest contributor to dropout rates in teenage girls (Strunk, 2008), it follows that these girls are more likely to suffer from a lack of functional literacy, which will in turn have a negative effect on their labour market outcomes.

Second generation effects, by which poor reading skills are passed on from mother to child, are also important to consider. As previously discussed, it has been shown that teenage mothers tend to have poorer labour market outcomes (e.g., Statistics Canada, 2006), and are therefore likely of generally lower socioeconomic status (SES).

In a large-scale meta-analytic study, Sirin (2005) showed that there is a medium to strong positive correlation in the literature between SES and academic achievement, wherein individuals of lower SES also tended to be lower achievers academically. Flax, Realpe-Bonilla, Roesler, Choudhury, and Benasich (2009) found an even more direct inter-generational relationship in terms of literacy skills. These researchers found that children whose parents reported a history of language-learning impairments were also likely to present with selected language-learning deficits in such areas as phonological awareness, non-word reading, and receptive and expressive language skills. It has also been found that a diagnosis of dyslexia also tends to run in families (Pennington, 1990). Given the finding that the children of parents with poorer reading skills tend to be poorer readers themselves, it is important to be able to identify at-risk children early-on; something the current study will strive to do.

The Current Study

The proposed study seeks to extend and refine previous research on reading deficits in pregnant teens by investigating the specific types of reading deficits that are found in this population. The current study will improve on past research in the following ways: (1) by collecting data in a Canadian city with a relatively high rate of teen pregnancy, (2) through the use of a control group that is demographically highly similar to the pregnant teen group and (3) the proposed assessment will use psychometrically-sound and clinically-relevant measures of reading achievement, providing a more externally valid outcome.

The specific research questions to be addressed include the following:

- (1) Are the reading skills of pregnant teens less developed than the reading skills of their never-pregnant peers in one or more domains of reading?
- (2) Given a positive finding with regard to the first question, can we identify specific domains of reading in which the pregnant teens' skills are less developed?

Based on these questions and the literature review presented, the current study will test the following hypotheses:

- (1) The reading skills of pregnant teens will be less developed than those of their never-pregnant peers in one or more domains of reading.
- (2) As 14- to 17-year olds are expected to have already mastered letter-sound relationships and decoding skills (Chall, 1983), it is expected that the pregnant teens will show deficits in the higher-order reading skills. Specifically, the pregnant teen group will score lower than the controls on tests of reading fluency and reading comprehension.

CHAPTER III

METHOD

Participants

At the outset of the current study, the intention was to test 25 pregnant participants and 25 control participants. Recruitment, however, proved to be more of a challenge than was anticipated. As a result, the sample size of both groups is smaller than was initially planned.

Experimental group. By the definition used for Canadian statistical purposes, a pregnancy involving a woman younger than 19 years when her pregnancy concludes is referred to as teen pregnancy. While this is considered to be the standard definition of teen pregnancy, in the current study a cut-off age of 17 years was used, as it has been shown that younger teens are at additional risk for adverse outcomes of pregnancy (Cooper, Leland, & Alexander, 1995).

The experimental group consists of three already-pregnant teens. The mean age was 15.94 years (SD = 0.99). These girls represent the only three who responded to recruitment efforts made through four local agencies that provide services to adolescents; the Teen Health Centre, Sandwich Community Health Centre, New Beginnings, and the obstetrical and maternal-fetal medicine clinics at Windsor Regional Hospital. Additionally, a number of sites were identified as providing services to adolescents at risk for teen pregnancy and were subsequently contacted. Recruitment was conducted through short presentations about the project at pregnancy education classes, direct contact with front-line staff, and through flyers posted at these centers and in the community. For a list of locations where flyers were posted, and for copies of the three flyers that were used, refer to Appendices A, B, C, and D, respectively. Only teens who

were primiparous (pregnant for the first time), and who were in their second trimester (gestational weeks 13-26) at the time of testing were considered for participation.

Exclusionary criteria included: a history of treatment for infertility; history of a medical disorder unrelated to pregnancy requiring ongoing treatment which makes the pregnancy high-risk (e.g., seizure disorder); non-English speaking individuals (although English does not need to be a first language); and an estimated Full Scale IQ of less than 80. No restrictions were made based on race, socio-economic status, marital status, or neighbourhood of residence.

Control group. The control group consists of 19 never-pregnant teens. The mean age of this group was 15.87 years ($SD = 1.02$). The same (non-pregnancy-related) exclusion criteria were used for the control group, and again no restrictions were made based on race, socio-economic status, marital status, or neighbourhood of residence. In order to recruit demographically-similar control participants, the pregnant participants were asked to give recruitment flyers to three to five female friends who are not currently pregnant.

Materials

Demographics questionnaire. Demographic information was collected via a form to be filled out by all participants (see Appendix E). This form requests information about identity, such as race/ethnicity, and date of birth, as well as household information intended to provide a clearer picture of the participants' living arrangements, in addition to information about the participants' medical, developmental, and academic histories. For participants who are currently pregnant, this form also has some brief questions about the pregnancy.

Wechsler Abbreviated Scales of Intelligence (WASI; Wechsler, 1999). This test is intended to provide an estimate of an examinee's intelligence. For the purposes of the current study, only the Vocabulary and Matrix Reasoning subtests from the WASI were administered. The WASI has an age range of 6 to 89 years, and the administration of the two tests took approximately 15 minutes.

The Vocabulary subtest is a 42-item test designed to measure expressive vocabulary, verbal knowledge, and the examinee's fund of information. The lower-end items on this subtest (items 1 to 4) require examinees to accurately name pictures which are displayed one at a time, while items 5 to 42 require the examinee to orally define words that are presented both orally and visually. Reliability coefficients for the Vocabulary subtest range from .90 to .93 across the age groups to be tested in the current study (ages 14 to 17), and evidence of concurrent validity comes from correlations coefficients of .72 and .88 (Wechsler, 1999) with the Vocabulary subtests on the Wechsler Intelligence Scale for Children, Third Edition (WISC-III) and the Wechsler Adult Intelligence Scale, Third Edition (WAIS-III), respectively.

The Matrix Reasoning subtest of the WASI is designed to measure nonverbal fluid reasoning and to give an estimate of general intellectual ability. Examinees will be shown stimuli with abstract patterns with examinees indicating which of five possible responses best completes patterns. There is a total of 35 items. Reliability coefficients for this subtest range from .86 to .91 across the age range, and this subtest has also been shown to display concurrent validity, with a correlation coefficient of .66 (Wechsler, 1999) with the WAIS-III Matrix Reasoning subtest.

The Test of Word Reading Efficiency (TOWRE; Torgesen, Wagner, & Rashotte, 1999). This test is composed of two subtests: the Sight Word Efficiency (SWE) subtest and the Phonemic Decoding Efficiency (PDE) subtest. This test has an age range of 6 years to 24 years, 11 months and the total administration time for both subtests is approximately 5 minutes.

The SWE subtest measures the number of printed real words that can be accurately identified and pronounced by the examinee within 45 seconds. The words are presented in 4 vertical lists on a single page. The alternate-form reliability coefficients for this subtest range from .86 to .94 across the age range to be tested in the current study, and this subtest has been shown to display concurrent validity through a correlation coefficient equal to .89 (Torgesen et al., 1999) with the Word Identification subtest of the Woodcock Reading Mastery Test-Revised (WRMT-R).

The Phonemic Decoding Efficiency subtest of the TOWRE measures the number of pronounceable printed nonwords that the examinee can accurately decode within 45 seconds. The nonwords are presented in 3 vertical lists on a single page. The alternate-form reliability coefficients for this subtest range from .93 to .97 across the age groups to be tested, and a correlation coefficient of .85 (Torgesen et al., 1999) between this subtest and the Word Attack subtest of the WRMT-R demonstrates evidence of concurrent validity.

Wide Range Achievement Test, Fourth Edition (WRAT-4; Wilkinson & Robertson, 2004). This test, which is intended to measure the basic academic skills, consists of four subtests. For the purposes of the current study, only the Word Reading and Spelling subtests from the WRAT-4 were administered. This test has an age range of 5 years to 94

years, 11 months and the administration for all four subtests takes between 30 and 45 minutes, so it took considerably less time to administer only two subtests.

The Word Reading subtest of the WRAT-4 measures letter and word decoding through letter identification and word recognition. All examinees were administered only the word reading part of this subtest, which is a 55-item test that measures the examinee's ability to accurately pronounce increasingly complex words that are presented visually. There are two forms for this test, Blue and Green, both of which were used in the current study. Internal consistency reliability coefficients for the Blue Form range from .91 to .95 across the age range to be tested, and for the Green Form, internal consistency reliability coefficients range from .88 to .93 across the age span of interest. Concurrent validity is demonstrated via a correlation coefficient of .71 (Wilkinson & Robertson, 2004) with the Word Reading subtest of the Wechsler Individual Achievement Test, Second Edition (WIAT-II)

The Spelling subtest of the WRAT-4 measures the examinee's ability to encode sounds into written form through the use of a dictated spelling format containing both letters and words. All participants, as more advanced readers, were administered only the word spelling part of the subtest, omitting the initial letter writing part. As with the Word Reading subtest, there are also two forms (Blue and Green) for the Spelling subtest. Internal consistency reliability coefficients for the Blue Form range from .90 to .93 across the age range to be tested, and for the Green Form, internal consistency reliability coefficients range from .89 to .90 across the age span of interest. Evidence of concurrent validity comes from a correlation coefficient of .64 (Wilkinson & Robertson, 2004) between this subtest and the Spelling subtest on the WIAT-II.

The Nelson-Denny Reading Test (NDRT; Brown, Fishco, & Hanna, 1993). This two-subtest test is designed to assess vocabulary, reading comprehension, and reading rate. This test can be administered to students from Grades 9 to 16 (with grades 13 to 16 corresponding to the undergraduate years), and the total administration time for the NDRT, including instructions, is approximately 45 minutes. The Vocabulary subtest consists of 80 items, each with five answer choices. This subtest is administered under timed conditions, with participants being given only 15 minutes in which to complete the test. The alternate-form reliability coefficient for the Vocabulary subtest is .89 (Brown et al., 1993). Evidence of predictive validity for this subtest (as well as for the Vocabulary and Total reading scores) comes from Wood (1982) who found that NDRT scores in conjunction with high school GPA reliably predict college GPA.

The Comprehension subtest consists of seven reading passages, with a total of 38 questions associated with these passages, each having five answer choices. The first minute of this subtest is used to identify the examinee's reading rate. This subtest is also administered under timed conditions; the examinee has 20 minutes in which to complete the test. The alternate form reliability coefficient is .81 for the Comprehension subtest (Brown et al., 1993), and .68 for the assessment of reading rate (Brown et al., 1993). In addition to the evidence provided by Wood (1982), further evidence of predictive validity for the Comprehension subtest of the NDRT comes from Feldt (1988), who found that scores on this subtest were significant predictors of undergraduates' performance in an introductory psychology class.

The NDRT also yields a total measure of reading proficiency, which is a linear combination of an examinee's scores on the Vocabulary and Comprehension subtests

(specifically, the Vocabulary score plus two times the Comprehension score). The alternate-forms reliability coefficient for the total reading score is .90, and predictive validity for this subtest, as was previously mentioned, comes from the study conducted by Wood (1982).

Procedure

Participants were recruited via contact initiated by the participants themselves with the primary researcher. Once potential participants had made contact and had expressed an interest in participating in the study, an interview and testing session were scheduled following successful completion of an over-the-phone screening procedure. The purpose of this screening procedure was to get an estimate of whether or not the participants would meet the IQ criterion, to ask pregnant girls questions about their pregnancies to make sure that they did not meet any of the exclusion criteria (i.e., must be in her second trimester, pregnancy must not be complicated by an unrelated medical condition, and she must not have been treated for infertility), and to ask control group participants whether there was a chance they might be pregnant.

Participants were asked to sign a consent form (see Appendices F, G, H, and I) that advised them of the standard rights afforded to research participants (e.g., confidentiality, privacy, and the right to withdraw without consequence). The consent form was explained in detail to all participants, and all who were administered the consent form chose to continue with participation in the study. Those participants who were expected to fall into the non-pregnant group (controls) were asked to take a urine pregnancy test to confirm their eligibility for that group.

The test battery, which includes all of the measures outlined above, as well as some which are beyond the scope of this thesis, were administered to all participants. The first test to be administered was the WASI, with the caveat that only those participants who present with an estimated WASI Full Scale IQ of at least 80 would be allowed to participate in the study.

Once all materials and test scores were obtained, each participant received a report of her results as well as a brief assessment of her psychological functioning. Also, for 18 of the participants, a \$50 gift certificate chosen from a number of local stores was provided. For the remaining four participants, the reward structure was changed so that each girl received a \$25 gift certificate for the Devonshire Mall and an entry into a draw for an iPod Touch. This change was made on the advice of two professional research consultants in an effort to boost recruitment numbers.

Study Design

The independent variable in the current study is the dichotomous between-subjects measure of whether or not the participant is pregnant. The dependent variables are the participants' scores on the Word Reading and Spelling subtests of the WRAT-4, the Comprehension and Reading Rate subtests of the NDRT, and the Sight Word Efficiency and Phonemic Decoding Efficiency subtests of the TOWRE. Raw scores were converted into standard scores so that valid comparisons could be made.

CHAPTER IV

RESULTS

Preliminary Analyses

Descriptive statistics were calculated for all dependent variables listed above. Mean scores and standard deviations are reported in Table 1. All measures were examined for outliers, defined as those individuals with scores exceeding three standard deviations beyond the mean. One individual's score on the Word Reading variable met this criterion. Specifically, the Word Reading scaled score of the participant in question was 145, which corresponds to a z-score of 3.01 relative to the control group's mean for Word Reading. This score was checked for accuracy, was found to be accurate, and therefore was left in the analysis to preserve the authenticity of the data set. As a result, there was no data missing from the analysis.

Prior to conducting the main analysis, the data were screened to determine whether any of the assumptions of MANOVA had been violated, thus ensuring the validity of the results. Univariate normality was assessed using values for skewness and kurtosis, in addition to the Shapiro-Wilk Test of Normality. It was found that for the control group, scores on the Word Reading variable were both skewed (skewness = 2.06) and kurtotic (kurtosis = 6.38). Additionally, the Shapiro-Wilk test for this variable was significant, suggesting that the distribution of scores on this variable differed significantly from a normal distribution (statistic [19] = .812, $p = .002$). However, in order to facilitate the interpretation of the results, because Word Reading was not one of the variables of interest in Hypothesis 2, and because the non-normality was likely a result of the aforementioned outlying score on the Word Reading variable, the data was not

transformed to correct for non-normality. All other control group measures were normally distributed. Univariate normality was not assessed for the pregnant group because, with so few cases, a comparison of the present data to a normal distribution would be meaningless. Multivariate normality for the control group was assessed through visual inspection of bivariate scatterplots of all dependent variable pairs for the ideal elliptical distribution of scores. The distribution of the data appears to approximate an ellipse in all cases except those which include the Word Reading score, again due to the outlier. Multivariate normality could not be assessed for the pregnant group due to the lack of a sufficient number of cases.

The assumption of independence of observations was met, in that the scores of each participant were not influenced by the scores of the other participants. Also, the fact that the dependent variables are highly correlated with each other means that they will form a meaningful composite when subjected to the MANOVA procedure. Bivariate correlations between the pairs of dependent variables are reported in Table 2. Finally, the assumption of continuous dependent variables and nominal grouping/independent variables has been met by the design of the study.

Main Analyses

It should be noted that recruitment for this project constituted a significant challenge. Not only was it a challenge to get the girls to call for an appointment in the first place, not returning messages, repeated no-showing, and failure to meet the WASI IQ criterion proved to be ongoing concerns. As a result, the sample size of the current study is small. As was mentioned, the pregnant group consisted of three participants

(mean age = 15.94 years, SD = 0.99) and the control group consisted of 19 participants (mean age = 15.87 years, SD = 1.02).

Hypothesis 1. To test the hypothesis that the reading skills of pregnant teens are less developed than those of their never-pregnant peers in one or more domains of reading, a one-way multivariate analysis of variance (MANOVA) was calculated with six dependent variables: scores on the Sight Word Efficiency and Phonemic Decoding Efficiency subtests of the TOWRE, the Word Reading and Spelling subtests of the WRAT-4, and the Comprehension and Reading Rate subtests of the NDRT. The independent variable was group (control vs. pregnant). Levene's test supported the assumption of homogeneity of variance for all variables. Homogeneity of covariance could not be assessed using Box's M test because there were not enough cases in the pregnant group to calculate measures of covariance between the two groups. A visual inspection of the covariance, however, suggests that the variance of the control group data is larger than that of the pregnant group. This means that the F value associated with the MANOVA test will be more conservative than it would have been if the covariance had been approximately equal, thus decreasing the power of the analyses. Using the Wilk's Lambda criterion (Field, 2005), it was found that teen pregnancy is not related to reading achievement, $F(6,15) = .186, p = .976, \text{partial } \eta^2 = .069$, with a small effect size.

Hypothesis 2. To test the hypothesis that pregnant teens show deficits in higher-order reading skills, four one-way analyses of variance (ANOVAs) were conducted using the four higher-order reading achievement measures as dependent variables. The higher-order measures include the Comprehension and Reading Rate measures from the NDRT and scores on the Sight Word Efficiency and Phonemic Decoding Efficiency subtests of

the TOWRE. The independent variable for all four ANOVAs was group (control vs. pregnant). Again, Levene's test supported the homogeneity of the between-group variance for all variables. Examination of the ANOVA results demonstrated that teen pregnancy is not related to higher-order reading achievement. Specifically, group membership was not related to scores on NDRT Comprehension, NDRT Reading Rate, Sight Word Efficiency, or Phonemic Decoding Efficiency. Relevant values are presented in Table 3. It should be noted that although all of the effect sizes should be considered small based on the partial η^2 criterion, when subjected to the Cohen's d criterion, the comparison between pregnant teens and never-pregnant teens has a medium effect size for the Word Reading, Reading Rate, and Sight Word Efficiency variables. Cohen's d effect sizes are presented along with means and standard deviations in Table 1.

CHAPTER V

DISCUSSION

Review of Primary Research Questions

The purpose of the current study was to extend and refine previous research on reading deficits in pregnant teens by investigating the specific types of reading deficits that are found within this population. Specifically, it was hypothesized that: a) the reading skills of pregnant teens would be less developed than those of their never-pregnant peers in one or more domains of reading, and b) that pregnant teens would show deficits in higher-order reading skills such as comprehension and fluency. This study was an improvement on previous research in three main ways: (1) a strictly Canadian sample was used, (2) the control group was highly-similar demographically to the experimental group, and (3) the measures used have been proven to be psychometrically-sound and clinically-relevant measures of reading achievement, thus providing a more externally valid outcome.

Review of Findings

Although prior research on reading deficits in pregnant teens suggests that this population does show a greater reading delay than teens who have never been pregnant (Matson & Haglund, 2000), this finding was not confirmed by the results of the current study. Hypothesis one stated that the reading skills of pregnant teens would be less developed in one or more domains of reading than the reading skills of teens who had never been pregnant. This hypothesis was not supported, in that no difference was found between the two groups when all of the measures of reading achievement were considered together.

Hypothesis two stated that pregnant teens would show specific deficits in higher-order reading skills. The data also did not support this hypothesis, in that no difference was found between the pregnant and control groups on comprehension and fluency scores. The results of the present study suggest that teen pregnancy may not be related to achievement in higher-order reading skills.

Overall, the goal of the current study was to investigate a possible relationship between teen pregnancy and reading achievement. Taken together, the results suggest that there is no relationship between teen pregnancy and reading achievement. Given, however, that there were only three participants in the pregnant group and 19 in the control group, it is difficult to say what the outcome would have been if the desired sample sizes had been attained. It is likely that the small sample size limited the power of the analysis, such that any differences that might otherwise have been present became undetectable. The sample size problem will be discussed as a major limitation of the current study.

Limitations

Despite the strengths of the present study, including the use of a Canadian sample, the recruitment of a highly demographically-similar control group, and the use of psychometrically-sound and clinically-relevant measures, there are several limitations inherent in the current research. Most notably, the sample size of both groups, but especially the pregnant group, is quite small. As was previously mentioned, the intention at the outset of the study was to compare 25 pregnant participants to 25 control participants. Recruitment, however, proved to be an ongoing challenge.

Several strategies were employed in recruiting participants for this project. One strategy involved posting flyers in the community that asked potential participants to call the primary researcher if they were interested in participating. This strategy proved to be almost wholly unsuccessful. The reason for the failure of this strategy to be effective is most likely that the flyers were consistently being taken down by the establishments at which they were posted, even though permission to post them had been attained at all locations. Another reason why the flyers may not have worked was that teenage girls might have been too intimidated to call a university professor to inquire about participation in a research study. In an attempt to ease the pressure on potential participants, an email address was added to the flyers so that girls could initiate contact via email instead of over the phone. This, however, did not prove to be a great improvement over the flyers with only a phone number on them, as only one email was received, and the girl who sent the email then did not respond to a follow-up email asking for her phone number so that the over-the-phone screening process could take place.

Another strategy that was expected to be an effective means of recruiting control participants that were demographically-similar to the pregnant participants was to have the pregnant girls hand out two to three flyers to their never-pregnant friends who would ideally call to participate in the study as well. The problem with this strategy was that it was impossible to track what the girls did with the flyers upon leaving their assessment appointments. Therefore, it is unclear whether a failure on the part of the pregnant participants to hand out the flyers, or a lack of interest or a failure to initiate contact on the part of their friends, was to blame for the failure of this strategy. What is clear is that no friends of the pregnant participants were included in the current study. Attempts were

still made to recruit at-risk control participants who were accessing services for adolescents in order to retain the match between the control and the pregnant participants.

A third strategy used to recruit participants involved short presentations given by the primary researcher at prenatal classes that were comprised of adolescent girls. This approach was expected to be especially effective because it involved making face-to-face contact with participants and allowed for the asking of questions, which should have reduced any anxiety that potential participants may have had about participating in research. The girls in these classes, however, did not appear to be motivated to participate in the current study, even given what should be considered a large reward, of which they were made aware at the time of the presentations.

A fourth strategy was to contact establishments where teenage girls either lived or visited regularly, and to have the adults in these places ask the girls directly whether they were interested in participating. This proved to be the most effective method of recruitment, likely because the girls were being tested in a place that they regularly frequented. Most of the girls who were recruited using this approach came from the Inn of Windsor, a group home for teenage girls. The girls were screened for participation en masse and were then tested at their convenience in a spare office at the Inn. This approach was also used to recruit girls from the Gino A. Marcus Community Complex. Contact was first made with the complex via New Beginnings. Eligible girls who attended the after-school program at Gino Marcus were approached by workers at New Beginnings and asked directly if they would be interested in participating in the study. As with the girls at the Inn, the girls from Gino Marcus were tested at the same place where they heard about the project, so the hit rates were much higher.

In addition to not hearing from enough girls in the first place, the no-show rates associated with the testing for this project were also a challenge. Girls were scheduled up to three times before being excluded from the study. The researcher who conducted the testing waited for at least an hour every time a girl did not show up for her appointment, just to make sure that she was not simply late to arrive. Upon later calling to see what had happened, the overwhelmingly common response was that the girls had simply forgotten about their appointments. This is surprising, given that attempts were made to contact all participants to remind them of their appointments.

Another problem involved the IQ criterion. Three of the girls who were scheduled to participate in the control group did not attain an estimated IQ score of 80 or above. In fact, all three of them presented with IQs that were well below the current study's cutoff. As a result, testing with these three girls was discontinued in order to avoid the confound associated with studying reading achievement in individuals of lower intelligence. Had these girls met the IQ criterion, the sample size of the control group would have been 22, which is closer to the planned sample size of 25 for this group.

As was mentioned in the Method section, the reward structure was changed mid-way through the project on the recommendation of seasoned local researchers. This may have been a mistake. Previous research demonstrates a link between impulsiveness and a number of factors that are precursors of teen pregnancy (e.g., early age of first sexual intercourse, higher number of sexual partners, non-use of contraception and condoms; Kahn, Kaplowitz, Goodman, and Emans, 2002), and also between impulsiveness and teen pregnancy itself (Herrman, 2007). Herrman (2007) states that the findings of her study suggest that teenage sexual activity tends to be spontaneous and unplanned. Studies such

as these suggest that those teens who become pregnant tend to be more impulsive than their never-pregnant peers. Research also demonstrates a link between impulsivity and a decreased ability to delay gratification. For example, Nower and Blaszczynski (2006) state that impulsive individuals are “likely to prefer immediate rather than delayed potentially larger rewards” (p. 69-70). As was previously discussed, compensation was changed from a \$50 reward in the form of a gift certificate to a \$25 reward and a chance to win an iPod Touch. Given that the timing of this change occurred when data from most of the control participants was collected and there was a greater demand for pregnant participants (pregnant girls being the ones who tend to be more impulsive and consequently less able to delay gratification), changing the reward in this way may have been a mistake because it involved more of a delay of gratification for the possibility of a larger reward at a later point in time.

Clinical Implications

Given that medium effect sizes were found on the Word Reading, Comprehension, and Reading Rate variables, it is expected that if more data were to be collected, significant results would be found. If this was the case, the current study may have important implications for educational policy and for the field of psychology, regardless of the directionality of the relationship. For example, if becoming pregnant as a teen has a negative effect on reading achievement, then interventions aimed at improving, or at least maintaining, the reading skills of pregnant teens should be implemented. Conversely, there will also be important implications of the finding that poor reading skills contribute to the chances of becoming pregnant as a teen. Specifically, interventions that are aimed at preventing teen pregnancy may need to be

written and presented at a lower reading level in order to accommodate poorer readers who may not fully understand what they are being taught about safe sex and pregnancy prevention. Thus, no matter the directionality of a potential relationship between reading achievement and teen pregnancy, finding that there is a relationship between these two variables will have important implications.

Future Directions

Based on the findings and limitations of the current study, recommendations can be made for future research. For example, future research might compare teens who do or do not attend school, because a comparison of pregnant teens who are still in school, pregnant teens who have dropped out of school, and never-pregnant teens who have dropped out of school would allow for a deeper investigation of a possible relationship between teen pregnancy and reading achievement. Future research might also look for potential differences in the reading achievement of teens who plan to follow through with their pregnancies and those who have had their pregnancies terminated. Finally, future research would benefit from knowledge of the types of recruitment strategies that were successful in finding participants and those which were not.

Conclusions

In summary, the current study found no association between teen pregnancy and reading achievement. Although the results are not generalizable due to an extremely small sample size, research such as this nonetheless highlights the possibility that such an association might exist. Given a larger sample size, and therefore greater power, this type of study has the potential to inform the literature of a potential factor that might be associated with the important societal issue of teen pregnancy.

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Table 1

Means and Standard Deviations for Measures

	Total		Control		Pregnant		Cohen's d
	M	SD	M	SD	M	SD	
WRAT-4							
Word Reading	98.86	12.96	99.89	13.55	92.33	6.03	0.58
Spelling	103.95	18.33	104.63	19.53	99.67	8.08	0.27
NRDT							
Comprehension	96.32	13.45	96.71	13.90	93.83	12.19	0.21
Reading Rate	100.16	18.61	101.13	19.49	94.00	12.29	0.43
TOWRE							
SWE	95.32	8.82	95.89	8.97	91.67	8.39	0.48
PDE	95.50	15.04	96.11	16.05	91.67	5.51	0.30

Note. WRAT-4 corresponds with Wide Range Achievement Test, Fourth Edition, NDRT with Nelson-Denny Reading Test, TOWRE with Test of Word Reading Efficiency, SWE with Sight Word Efficiency, and PDE with Phonemic Decoding Efficiency.

N = 22, Control: $n = 19$, Pregnant $n = 3$

Table 2

Bivariate Correlations between Measures

	WR	Sp	Comp	Rate	SWE	PDE
WR	1					
Sp	.622**	1				
Comp	.508**	.684**	1			
Rate	.428*	.688**	.645**	1		
SWE	.558**	.465*	.576**	.492*	1	
PDE	.684**	.562**	.567**	.455*	.754**	1

Note. WR corresponds with WRAT-4 Word Reading, Sp with WRAT-4 Spelling, Comp with NDRT Comprehension, Rate with NDRT Reading Rate, SWE with TOWRE Sight Word Efficiency, and PDE with TOWRE Phonemic Decoding Efficiency.

** Correlation is significant at the .01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

N = 22

Table 3

Tests of Between-Subjects Effects for Higher-Order Reading Measures

	F	Sig.	Partial η^2
NDRT			
Comprehension	.114	.740	.006 (small)
Reading Rate	.369	.550	.018 (small)
TOWRE			
SWE	.583	.454	.028 (small)
PDE	.217	.646	.011 (small)

Note. NDRT corresponds with Nelson-Denny Reading Test, TOWRE with Test of Word Reading Efficiency, SWE with Sight Word Efficiency, and PDE with Phonemic Decoding Efficiency.

$df_{\text{group}} = 1$ and $df_{\text{error}} = 20$ for all tests

N = 22

APPENDICES

APPENDIX A

Recruitment Sites

Flyers were posted in the following places:

Location	Address
Shoppers Drug Mart*	1760 Huron Church Rd.
Shoppers Drug Mart*	Ottawa St. and Walker Rd.
Shoppers Drug Mart*	3100 Howard Ave.
Shoppers Drug Mart*	2670 Tecumseh Rd. W.
Shoppers Drug Mart	1675 Wyandotte St. W.
Starbucks*	301 Ouellette Ave.
Starbucks*	1690 Huron Church Rd.
Starbucks*	4450 Walker Rd.
Starbucks*	Devonshire Mall
Ardene*	Devonshire Mall
Bluenotes*	Devonshire Mall
Chapters*	Devonshire Mall
Claire's	Devonshire Mall
Shoppers Drug Mart*	Devonshire Mall
Garage	Devonshire Mall
Jacob Connexion	Devonshire Mall
Old Navy*	Devonshire Mall
Smart Set	Devonshire Mall

Suzy Shier	Devonshire Mall
Urban Planet	Devonshire Mall
Zellers	Devonshire Mall
Cineplex Odeon*	Devonshire Mall
Customer Service	Devonshire Mall
Obstetrics and Maternal Fetal Medicine Clinics	Windsor Regional Hospital, Met Campus
Sandwich Community Health Centre	749 Felix Ave.
New Beginnings sites	Main office: 1049 Janette Ave.
Teen Health Centre*	1585 Ouellette Ave.
Gino A. Marcus Community Complex*	1168 Drouillard Rd.
Sandwich Teen Action Group	3735 King St.
The Inn of Windsor*	1687 Wyandotte St. E.
Famous Players SilverCity Theatre*	4611 Walker Rd.
Tim Horton's*	2625 Tecumseh Rd. W.
Zellers	Tecumseh Mall
McDonald's*	883 Huron Church Rd.
McDonalds*	3195 Howard Ave.
Pizza Plus	704 Felix Ave.
Shawarma Palace	276 Ouellette Ave.
Laundromat	Division Rd. in South Windsor
Mill Coin Laundry & Dry Cleaning	380 Mill St.
Pregnancy Resource Centre	St. Clair College

Employment Resource Centre 400 City Hall Square

Youth Employment Services Office 547 Victoria Ave.

Windsor-Essex Catholic District School Board high school guidance counsellor offices

Greater Essex County District School Board high school guidance counsellor offices

GECDSB Public Alternative Secondary School program sites

**denotes locations that were visited repeatedly*

APPENDIX B

Flyer Advertising the Study under the Original Reward Structure

Teen study - Dr. Miller
(519) 253-3000, ext. 2226

Teen study - Dr. Miller
(519) 253-3000, ext. 2226

Teen study - Dr. Miller
(519) 253-3000, ext. 2226

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(519) 253-3000, ext. 2226

Teen study - Dr. Miller
(519) 253-3000, ext. 2226

Teen study - Dr. Miller
(519) 253-3000, ext. 2226

Are you a 14-17 year old female?

Would you like to participate in research?

We are recruiting teen girls in two groups: those who are currently pregnant and those who have never been pregnant. We are examining the role reading skills and impulse control play in teen pregnancy. Participation requires a 2.5 - 3 hour assessment session. Participants will receive feedback about their performance and a \$50 gift certificate for full participation.

Contact: Dr. Carlin J. Miller

Department of Psychology, University of Windsor
(519) 253-3000, ext. 2226; cjmiller@uwindsor.ca



APPENDIX C

Flyer Advertising the Study to Pregnant Participants under the Revised Reward Structure

Are you a girl between 14 and 17?

Are you pregnant?

Are you interested in learning more about yourself?

Would you like to earn a \$25 gift certificate and a chance to win an iPod Touch?

... Then sign up now to be a part of this research study!

The study takes about three hours and you decide when it is convenient for you. You will be asked to read some materials and answer questions about the way you think and feel.

To get involved, contact:

Dr. Carlin J. Miller

**Department of Psychology, University of Windsor
(519) 253-3000, ext. 2226; teenpreg@uwindsor.ca**



APPENDIX D

Flyer Advertising the Study to Control Participants under the Revised Reward Structure

teenpreg@uwindsor.ca
(519) 253-3000, ext. 2226

Are you a girl between 14 and 17?

Are you interested in learning more about yourself?

Would you like to earn a \$25 Devonshire Mall gift certificate and a chance to win an iPod Touch?

Then sign up to be part of this research study!!

This study takes about three hours and you decided when it is convenient for you. You will be asked to read some materials and answer questions about the way you think and feel.

To get involved, contact:

Dr. Carlin J. Miller

Department of Psychology, University of Windsor
(519) 253-3000, ext. 2226; teenpreg@uwindsor.ca



APPENDIX E

Demographic Information

Name: _____

Date of Birth: ___/___/___ Today's Date: ___/___/___ Age: _____

If pregnant, estimated due date: ___/___/___ (GA ___ - ___)

Home Address: _____

Home Phone: _____

Email: _____

Instructions:** The items in this questionnaire address issues pertaining to your medical history and family background. For questions that include numbered choice options, please circle the number(s) that best describes you. Other items will provide you with space(s) to provide a written response. Be sure to read each item carefully, and direct any questions to a member of the research staff. Try to answer each item as best you can, however, if you feel uncomfortable with any question, you do not need to answer it. Please know that your answers will be kept completely confidential. **Please do not write your name on any page but this front page. (This cover page will be detached and stored with your consent forms to protect your confidentiality.)

(FOR PROJECT USE ONLY - ID # _____)

I. DEMOGRAPHIC INFORMATION

Date of Birth (DD/MM/YY) : ___/___/___ Today's Date (DD/MM/YY): ___/___/___

Race/ethnic background: (please circle)

- [1] ABORIGINAL
- [2] ASIAN OR OF ASIAN DESCENT
- [3] HISPANIC/LATINA
- [4] BLACK OR OF AFRICAN DESCENT
- [5] NON-HISPANIC WHITE OR CAUCASIAN
- [6] OTHER/MIXED (please indicate) _____

II. HOUSEHOLD INFORMATION

Total number of household members (including you): _____

of children (under 18 yrs. of age): _____ # of adults: _____

Primary language spoken in the home: _____

Other languages spoken in the home: _____

Please list all household members:

FIRST NAME	SEX	AGE	RELATION TO YOU If not FULL siblings indicate relatedness: FULL, STEP, HALF, ADOPTIVE	OCCUPATION	HIGHEST GRADE COMPLETED

III. PREGNANCY INFORMATION (complete this section only if you are currently pregnant)

If pregnant, estimated due date: ___/___/___ (GA ___-___)

Was your pregnancy planned? [1] NO [2] YES

Did you consult with your physician prior to conception? [1] NO [2] YES

Are you currently receiving prenatal care? [1] NO [2] YES

If YES, What month of pregnancy did prenatal care start: _____

Have you had any significant illnesses during your pregnancy? [1] NO [2] YES

If YES, please specify _____

Have you been told at any point during your pregnancy that there were specific concerns about you or your baby?

[1] NO [2] YES

If YES, please specify _____

Before your pregnancy, did you use:

Tobacco [1] NO [2] YES, specify amount (*cigarettes/day*) _____

Alcohol [1] NO [2] Less than weekly [3] Weekly [4] Daily

Illegal/Illicit Drugs [1] NO [2] YES

If YES, specify type of drug used and how often? _____

During the pregnancy have you used:

Tobacco [1] NO [2] YES, specify amount (*cigarettes/day*) _____

Alcohol [1] NO [2] Less than weekly [3] Weekly [4] Daily

Illegal/Illicit Drugs [1] NO [2] YES

If YES, specify type of drug used and how often? _____

Other than prenatal vitamins, are you currently taking ANY prescription or non-prescription medications?

[1] NO [2] YES, please specify _____

IV. MEDICAL HISTORY

Were you ever diagnosed with ADHD or did you ever take a stimulant medication, such as Ritalin? [1] NO [2] YES

Have you ever had any kind of head injury? [1] NO [2] YES

If YES, what happened _____

IF YES, was there a loss of consciousness? [1] NO [2] YES

IF YES, for how long (*in hours*)? _____

Have you ever had a seizure? [1] NO [2] YES

IF YES, specify type:

[1] FEBRILE, specify # of times _____

[2] PETIT MAL/ABSENCE, specify # of times _____

[3] GRAND MAL/TONIC-CLONIC, specify # of times _____

[4] OTHER, please specify type and # of times _____

IF YES, were you ever medicated for seizures? [1] NO [2] YES

Specify when and type of medication: _____

V. DEVELOPMENTAL HISTORY

Has anyone ever told you that you:

Started talking late? [1] NO [2] YES

Crawled or walked late? [1] NO [2] YES

Were difficult to manage as a young child? [1] NO [2] YES

Were late in being toilet trained? [1] NO [2] YES

Had problems getting along with other children? [1] NO [2] YES

Were aggressive toward others? [1] NO [2] YES

VI. ACADEMIC HISTORY

Your current school: _____ Grade: _____

How long have you attended this school? _____ years

Do you like school? [1] NO [2] YES

Are you having any difficulty in school? [1] NO [2] YES

IF YES, please describe

Do you receive any special services at school? [1] NO [2] YES

IF YES, please specify

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE !! ☺

APPENDIX F

Consent to Participate in Research (Currently Pregnant, Original Reward)



CONSENT TO PARTICIPATE IN RESEARCH (CURRENTLY PREGNANT)

Title of Study: Impulse Control and Reading Achievement in Pregnant Teens

You are asked to participate in a research study conducted by Carlin J. Miller, Ph.D. and her research group from the Department of Psychology at the University of Windsor. This research is funded by a Humanities and Social Science Research Grant from the Office of Research Services at the University of Windsor.

If you have any questions or concerns about the research, please feel to contact Dr. Miller by phone (519-253-3000, x. 2226) or by email (cjmiller@uwindsor.ca).

PURPOSE OF THE STUDY

The purpose of this study is two-fold: (1) to compare impulse control (ability to delay gratification, use information to make informed decisions, and to avoid long-term consequences) of pregnant *and* non-pregnant teen girls and (2) to compare reading achievement (untimed word reading, reading comprehension, reading rate, and spelling) in pregnant *and* non-pregnant teen girls.

PROCEDURES

It is anticipated that your participation will require 2.5-3 hours to complete and we hope that you can complete this assessment in one appointment. If you are uncomfortable or need a break at any time, please let your examiner know. If you volunteer to participate in this study, you will be asked to do the following:

- All participants will be asked to complete the following assessment tools with an examiner:
 - You will be asked to wear 2 *actigraphs*, which are small digital watch-like devices, one on a small belt around your non-dominant wrist and one around your non-dominant ankle. These devices count how often that body part moves. These devices cannot hurt you or cause discomfort in any way.
 - You will be administered a *brief intelligence screening*. These two subtests from the Wechsler Abbreviated Scales of Intelligence (WASI). You will not receive an IQ score from this screening.
 - You will be administered the Test of Word Reading Efficiency (TOWRE). This is a measure your ability to *read sight words quickly* and your ability to *quickly decode words you don't know using phonetic strategies*.
 - You will be administered two subtests from the Wide Range Achievement Test, Fourth Edition (WRAT4). These subtests measure your ability to *recognize written words* and *spell a dictated list of words*. Both subtests are untimed.
 - You will be administered the Nelson-Denny Reading Test, which measures your *vocabulary, how well you understand what you read, and how quickly you read passages*.
 - You will be asked to do a complete a computerized measure, the Test of Executive Control, that assessed your ability use information over time (*working memory*) and stop yourself from making wrong responses (*inhibitory control*).
- You will also be asked to complete some self-report measures, including:
 - A *demographics* form that contains information about your identity, such as race and date of birth. This form also has some brief questions about your pregnancy.
 - A measure of *personality* called the NEO Five-Factor Inventory.
 - A measure of symptoms, such as *having difficulty paying attention*, commonly associated with Attention-deficit/Hyperactivity Disorder.
 - A measure of your executive functioning skills, such as *self-monitoring, ability to multi-task, and complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).
 - A measure of your *risk-taking behaviours*, including sexual behaviour, drugs and alcohol, and

- law-breaking behaviours.
- A measure of *positive coping and social resources*, such as having trustworthy individuals in one's life and time to pursue leisure activities.
- You will be asked to deliver the following forms to a parent or other adult who knows you well, such as a grandparent you see weekly or a counsellor. These forms need to be returned as soon as possible in the provided self-addressed, stamped envelope. If we do not receive the forms, we will call you to remind you but we cannot call the person to whom you gave the forms because it would violate your privacy.
- A measure of symptoms, such as *having difficulty paying attention*, commonly associated with Attention-deficit/Hyperactivity Disorder.
- A measure of your executive functioning skills, such as *self-monitoring, ability to multi-task, and complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).

POTENTIAL RISKS AND DISCOMFORTS

We do not think there is any significant risk associated with this study. You may experience feel somewhat worried or uncomfortable while filling out our forms, especially if you are worried about a pregnancy or are having other difficulties in your life. If you feel worried or upset, please discuss your concerns with the examiner. If you continue to feel badly after you leave the assessment, please call Dr. Miller in her office (519-253-2000 ext. 2226).

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

As a result of your full participation in this study, we will give you \$50 in gift certificates as payment for your time and travel. You will be given a list of possible stores from which to choose after your full assessment session is completed. We will send your gift certificates by mail with a summary of your participation after your file is complete. If you have any questions about this summary, please contact Dr. Miller (519-253-2000 ext. 2226).

The main purpose of this study is to increase our understanding of the relationships between reading skills, the ability to control impulses, and teen pregnancy. Society may benefit if we better understand these relationships.

PAYMENT FOR PARTICIPATION

As a result of your full participation in this study, we will give you \$50 in gift certificates as payment for your time and travel. You will be given a list of possible stores from which to choose after your full assessment session is completed. We will send your gift certificates by mail with a summary of your participation after your file is complete.

CONFIDENTIALITY

Any information you provide and that can be connected to you will remain confidential. No one will be told what you reported without your permission. We will not discuss your results with anyone without your written permission. Once your forms are completed, your unique subject identification number will be written on every form and your name will be removed from all forms. These unique subject identification numbers will be used for data entry involving your responses. Consent forms and rating forms will be store separately in locked cabinets in a locked on-campus office. Only Dr. Miller will have access to your personally-identifying information. In the event these data are ever to be destroyed, their destruction will be carried out in a manner to preserve your privacy.

There is one set of circumstances that would possibly necessitate a breach in confidentiality. In the event you disclose that you are in danger currently or you are experiencing abuse/neglect, we may tell the appropriate authorities. Before we contact the authorities, we will discuss our concerns with you. As someone who works with children and families, Dr. Miller is a mandatory reporter for child abuse/neglect and is required by law to protect the rights of her research participants.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may decide not to participate at any time without consequences of any kind. Specifically, we will not report to your decision to anyone, including your health care provider. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so, such as it is discovered that you do not meet eligibility criteria. In that event, Dr. Miller will discuss the reasons you are not eligible with you.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Web address: <http://www.uwindsor.ca/cjmiller>
Date when results are available: Summer 2010

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study “Impulse Control and Reading Achievement in Pregnant Teens” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Signature of Subject

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

APPENDIX G

Consent to Participate in Research (Not Currently Pregnant, Original Reward)



CONSENT TO PARTICIPATE IN RESEARCH (NOT CURRENTLY PREGNANT)

Title of Study: Impulse Control and Reading Achievement in Pregnant Teens

You are asked to participate in a research study conducted by Carlin J. Miller, Ph.D. and her research group from the Department of Psychology at the University of Windsor. This research is funded by a Humanities and Social Science Research Grant from the Office of Research Services at the University of Windsor.

If you have any questions or concerns about the research, please feel to contact Dr. Miller by phone (519-253-3000, x. 2226) or by email (cjmiller@uwindsor.ca).

PURPOSE OF THE STUDY

The purpose of this study is two-fold: (1) to compare impulse control (ability to delay gratification, use information to make informed decisions, and to avoid long-term consequences) of pregnant *and* non-pregnant teen girls and (2) to compare reading achievement (untimed word reading, reading comprehension, reading rate, and spelling) in pregnant *and* non-pregnant teen girls.

PROCEDURES

It is anticipated that your participation will require 2.5-3 hours to complete and we hope that you can complete this assessment in one appointment. If you are uncomfortable or need a break at any time, please let your examiner know. If you volunteer to participate in this study, you will be asked to do the following:

- Non-pregnant participants (controls) will be asked to take a urine pregnancy test to confirm their eligibility for the project. These results, as with all data collected for this study, will be kept confidential and we will share these results with you immediately.
- All participants will be asked to complete the following assessment tools with an examiner:
 - You will be asked to wear 2 *actigraphs*, which are small digital watch-like devices, one on a small belt around your non-dominant wrist and one around your non-dominant ankle. These devices count how often that body part moves. These devices cannot hurt you or cause discomfort in any way.
 - You will be administered a *brief intelligence screening*. These two subtests from the Wechsler Abbreviated Scales of Intelligence (WASI). You will not receive an IQ score from this screening.
 - You will be administered the Test of Word Reading Efficiency (TOWRE). This is a measure your ability to *read sight words quickly* and your ability to *quickly decode words you don't know using phonetic strategies*.
 - You will be administered two subtests from the Wide Range Achievement Test, Fourth Edition (WRAT4). These subtests measure your ability to *recognize written words* and *spell a dictated list of words*. Both subtests are untimed.
 - You will be administered the Nelson-Denny Reading Test, which measures your *vocabulary, how well you understand what you read, and how quickly you read passages*.
 - You will be asked to do a complete a computerized measure, the Test of Executive Control, that assessed your ability use information over time (*working memory*) and stop yourself from making wrong responses (*inhibitory control*).
- You will also be asked to complete some self-report measures, including:
 - A *demographics* form that contains information about your identity, such as race and date of birth. This form also has some brief questions about your pregnancy.
 - A measure of *personality* called the NEO Five-Factor Inventory.
 - A measure of symptoms, such as *having difficulty paying attention*, commonly associated with Attention-deficit/Hyperactivity Disorder.

- A measure of your executive functioning skills, such as *self-monitoring*, *ability to multi-task*, and *complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).
- A measure of your *risk-taking behaviours*, including sexual behaviour, drugs and alcohol, and law-breaking behaviours.
- A measure of *positive coping and social resources*, such as having trustworthy individuals in one's life and time to pursue leisure activities.
- You will be asked to deliver the following forms to a parent or other adult who knows you well, such as a grandparent you see weekly or a counsellor. These forms need to be returned as soon as possible in the provided self-addressed, stamped envelope. If we do not receive the forms, we will call you to remind you but we cannot call the person to whom you gave the forms because it would violate your privacy.
- A measure of symptoms, such as *having difficulty paying attention*, commonly associated with Attention-deficit/Hyperactivity Disorder.
- A measure of your executive functioning skills, such as *self-monitoring*, *ability to multi-task*, and *complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).

POTENTIAL RISKS AND DISCOMFORTS

We do not think there is any significant risk associated with this study. You may experience feel somewhat worried or uncomfortable while filling out our forms, especially if you are worried about a problem or are having other difficulties in your life. If you feel worried or upset, please discuss your concerns with the examiner. If you continue to feel badly after you leave the assessment, please call Dr. Miller in her office (519-253-2000 ext. 2226).

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

As a result of your full participation in this study, we will give you \$50 in gift certificates as payment for your time and travel. You will be given a list of possible stores from which to choose after your full assessment session is completed. We will send your gift certificates by mail with a summary of your participation after your file is complete. If you have any questions about this summary, please contact Dr. Miller (519-253-2000 ext. 2226).

The main purpose of this study is to increase our understanding of the relationships between reading skills, the ability to control impulses, and teen pregnancy. Society may benefit if we better understand these relationships.

PAYMENT FOR PARTICIPATION

As a result of your full participation in this study, we will give you \$50 in gift certificates as payment for your time and travel. You will be given a list of possible stores from which to choose after your full assessment session is completed. We will send your gift certificates by mail with a summary of your participation after your file is complete.

CONFIDENTIALITY

Any information you provide and that can be connected to you will remain confidential. No one will be told what you reported without your permission. We will not discuss your results with anyone without your written permission. Once your forms are completed, your unique subject identification number will be written on every form and your name will be removed from all forms. These unique subject identification numbers will be used for data entry involving your responses. Consent forms and rating forms will be store separately in locked cabinets in a locked on-campus office. Only Dr. Miller will have access to your personally-identifying information. In the event these data are ever to be destroyed, their destruction will be carried out in a manner to preserve your privacy.

There is one set of circumstances that would possibly necessitate a breach in confidentiality. In the event you disclose that you are in danger currently or you are experiencing abuse/neglect, we may tell the appropriate authorities. Before we contact the authorities, we will discuss our concerns with you. As someone who works with children and families, Dr. Miller is a mandatory reporter for child abuse/neglect and is required by law to protect the rights of her research participants.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may decide not to participate at any time without consequences of any kind. Specifically, we will not report to your decision to anyone, including your health care provider. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so, such as it is discovered that you do not meet eligibility criteria. In that event, Dr. Miller will discuss the reasons you are not eligible with you.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Web address: <http://www.uwindsor.ca/cjmilller>
Date when results are available: Summer 2010

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study “Impulse Control and Reading Achievement in Pregnant Teens” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Signature of Subject

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

APPENDIX H

Consent to Participate in Research (Currently Pregnant, Revised Reward)



CONSENT TO PARTICIPATE IN RESEARCH (CURRENTLY PREGNANT)

Title of Study: Impulse Control and Reading Achievement in Pregnant Teens

You are asked to participate in a research study conducted by Carlin J. Miller, Ph.D. and her research group from the Department of Psychology at the University of Windsor. This research is funded by a Humanities and Social Science Research Grant from the Office of Research Services at the University of Windsor.

If you have any questions or concerns about the research, please feel to contact Dr. Miller by phone (519-253-3000, x. 2226) or by email (cjmillier@uwindsor.ca).

PURPOSE OF THE STUDY

The purpose of this study is two-fold: (1) to compare impulse control (ability to delay gratification, use information to make informed decisions, and to avoid long-term consequences) of pregnant *and* non-pregnant teen girls and (2) to compare reading achievement (untimed word reading, reading comprehension, reading rate, and spelling) in pregnant *and* non-pregnant teen girls.

PROCEDURES

It is anticipated that your participation will require 2.5-3 hours to complete and we hope that you can complete this assessment in one appointment. If you are uncomfortable or need a break at any time, please let your examiner know. If you volunteer to participate in this study, you will be asked to do the following:

- All participants will be asked to complete the following assessment tools with an examiner:
 - You will be asked to wear 2 *actigraphs*, which are small digital watch-like devices, one on a small belt around your non-dominant wrist and one around your non-dominant ankle. These devices count how often that body part moves. These devices cannot hurt you or cause discomfort in any way.
 - You will be administered a *brief intelligence screening*. These two subtests from the Wechsler Abbreviated Scales of Intelligence (WASI). You will not receive an IQ score from this screening.
 - You will be administered the Test of Word Reading Efficiency (TOWRE). This is a measure your ability to *read sight words quickly* and your ability to *quickly decode words you don't know using phonetic strategies*.
 - You will be administered two subtests from the Wide Range Achievement Test, Fourth Edition (WRAT4). These subtests measure your ability to *recognize written words* and *spell a dictated list of words*. Both subtests are untimed.
 - You will be administered the Nelson-Denny Reading Test, which measures your *vocabulary, how well you understand what you read, and how quickly you read passages*.
 - You will be asked to do a complete a computerized measure, the Test of Executive Control, that assessed your ability use information over time (*working memory*) and stop yourself from making wrong responses (*inhibitory control*).
- You will also be asked to complete some self-report measures, including:
 - A *demographics* form that contains information about your identity, such as race and date of birth. This form also has some brief questions about your pregnancy.
 - A measure of *personality* called the NEO Five-Factor Inventory.
 - A measure of symptoms, such as *having difficulty paying attention*, commonly associated with Attention-deficit/Hyperactivity Disorder.
 - A measure of your executive functioning skills, such as *self-monitoring, ability to multi-task, and complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).
 - A measure of your *risk-taking behaviours*, including sexual behaviour, drugs and alcohol, and

Web address: <http://www.uwindsor.ca/cjmilller>
Date when results are available: Fall 2010

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study “Impulse Control and Reading Achievement in Pregnant Teens” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Signature of Subject

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

APPENDIX I

Consent to Participate in Research (Not Currently Pregnant, Revised Reward)



CONSENT TO PARTICIPATE IN RESEARCH (NOT CURRENTLY PREGNANT)

Title of Study: Impulse Control and Reading Achievement in Pregnant Teens

You are asked to participate in a research study conducted by Carlin J. Miller, Ph.D. and her research group from the Department of Psychology at the University of Windsor. This research is funded by a Humanities and Social Science Research Grant from the Office of Research Services at the University of Windsor.

If you have any questions or concerns about the research, please feel to contact Dr. Miller by phone (519-253-3000, x. 2226) or by email (cjmillier@uwindsor.ca).

PURPOSE OF THE STUDY

The purpose of this study is two-fold: (1) to compare impulse control (ability to delay gratification, use information to make informed decisions, and to avoid long-term consequences) of pregnant *and* non-pregnant teen girls and (2) to compare reading achievement (untimed word reading, reading comprehension, reading rate, and spelling) in pregnant *and* non-pregnant teen girls.

PROCEDURES

It is anticipated that your participation will require 2.5-3 hours to complete and we hope that you can complete this assessment in one appointment. If you are uncomfortable or need a break at any time, please let your examiner know. If you volunteer to participate in this study, you will be asked to do the following:

- Non-pregnant participants (controls) will be asked to take a urine pregnancy test to confirm their eligibility for the project. These results, as with all data collected for this study, will be kept confidential and we will share these results with you immediately.
- All participants will be asked to complete the following assessment tools with an examiner:
 - You will be asked to wear 2 *actigraphs*, which are small digital watch-like devices, one on a small belt around your non-dominant wrist and one around your non-dominant ankle. These devices count how often that body part moves. These devices cannot hurt you or cause discomfort in any way.
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 - A measure of symptoms, such as *having difficulty paying attention*, commonly associated with Attention-deficit/Hyperactivity Disorder.

- A measure of your executive functioning skills, such as *self-monitoring, ability to multi-task, and complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).
- A measure of your *risk-taking behaviours*, including sexual behaviour, drugs and alcohol, and law-breaking behaviours.
- A measure of *positive coping and social resources*, such as having trustworthy individuals in one's life and time to pursue leisure activities.
- You will be asked to deliver the following forms to a parent or other adult who knows you well, such as a grandparent you see weekly or a counsellor. These forms need to be returned as soon as possible in the provided self-addressed, stamped envelope. If we do not receive the forms, we will call you to remind you but we cannot call the person to whom you gave the forms because it would violate your privacy.
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- A measure of your executive functioning skills, such as *self-monitoring, ability to multi-task, and complete tasks*, called the Behavior Rating Inventory of Executive Functioning (BRIEF).

POTENTIAL RISKS AND DISCOMFORTS

We do not think there is any significant risk associated with this study. You may experience feel somewhat worried or uncomfortable while filling out our forms, especially if you are worried about a problem or are having other difficulties in your life. If you feel worried or upset, please discuss your concerns with the examiner. If you continue to feel badly after you leave the assessment, please call Dr. Miller in her office (519-253-2000 ext. 2226).

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

As a result of your full participation in this study, we will give you a \$25 Devonshire Mall gift certificate as payment for your time and travel, which we will send by mail with a summary of your participation after your file is complete. If you have any questions about this summary, please contact Dr. Miller (519-253-2000 ext. 2226). You are also eligible to be entered in a drawing for an iPod Touch. Do you wish to be entered? (please initial your response)

_____ Yes

_____ No

The main purpose of this study is to increase our understanding of the relationships between reading skills, the ability to control impulses, and teen pregnancy. Society may benefit if we better understand these relationships.

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There is one set of circumstances that would possibly necessitate a breach in confidentiality. In the event you disclose that you are in danger currently or you are experiencing abuse/neglect, we may tell the appropriate authorities. Before we contact the authorities, we will discuss our concerns with you. As someone who works with children and families, Dr. Miller is a mandatory reporter for child abuse/neglect and is required by law to protect the rights of her research participants.

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FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Web address: <http://www.uwindsor.ca/cjmiller>
Date when results are available: Fall 2010

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

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Name of Subject

Signature of Subject

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

VITA AUCTORIS

NAME	Jessica Menard
PLACE OF BIRTH	Kingston, ON
YEAR OF BIRTH	1986
EDUCATION	Frontenac Secondary School, Kingston, ON 2000 – 2004 Mount Allison University, Sackville, NB 2004 – 2008, B.Sc.H. University of Windsor, Windsor, ON 2008 – 2010, M.A.