University of Alberta

Examining Resilience among University Students with Reading Difficulties Using Internal and External Protective Factors

by

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Dedication

I would like to dedicate this dissertation

to my late grandparents, Steve and Mollie Stack,

who instilled in me the qualities to

work hard, stay focused, and most importantly,

to enjoy the journey.

Abstract

This dissertation consists of three papers investigating the impact of intrapersonal and interpersonal factors on life satisfaction and academic achievement of adults with reading difficulty (RD). Participants were university students or recent graduates. The first paper examines the impact of intrapersonal and interpersonal resilience, persistence, and number of difficulties in addition to RD on life satisfaction and academic achievement among 120 adults with RD. Intrapersonal resilience related positively to interpersonal resilience and persistence, and both resilience factors associated negatively with number of difficulties. Intrapersonal resilience explained general and self satisfaction and interpersonal resilience explained social satisfaction. Academic achievement did not correlate with any study variables, thus I did not examine it further.

The second paper examines three different models to understand the impact of number of difficulties, social support, and community support on life satisfaction and academic achievement among 120 adults with RD. Participants responded to surveys assessing perceived social support, perceived community support, number of difficulties in addition to RD, life satisfaction, and academic achievement. Results supported a main effect model in which social, but not community, support explained life satisfaction. Social and community support did not moderate number of difficulties and life satisfaction, lending no support to a buffering effect. A mediation model showed that social support partially mediated number of difficulties and life satisfaction. Academic achievement did not correlate with any study variables, thus I did not examine it further.

The third paper examines what social ties 107 adults with RD report assist them to achieve goals, outlets for developing social ties, resources mobilized within relationships, and impact of social ties' status on academic achievement. Adults often named friends, parents, and significant others as social ties. They developed personal ties through social media networking and close relationships, and institutional ties through academic centres and university services, among others. Resources mobilized among personal and institutional ties included emotional and social support, advice and planning, writing and studying help, and goal setting. Institutional ties also afforded job search aid, accommodations, skill development, financial support, and mental health services. The status of employed, but not student, ties explained academic achievement.

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CHAPTER I: INTRODUCTION

Adults with a reading difficulty (RD) may experience problems with decoding, phonetic knowledge, word recognition, reading accuracy, reading speed, or reading comprehension, which interfere with academic achievement and daily activities that require reading skills (American Psychiatric Association, 2000; Learning Disabilities Association of Canada, 2002). RD is a life-long condition, and academic challenges, among others, may increase as individuals reach adulthood (Malcolm, Polatajko, & Simons, 1990) and enter postsecondary education (Gerber et al., 1990). Adults with RD are less likely to attend postsecondary institutions compared to adults without RD (Blackorby & Wagner, 1996; Klein & Mannuzza, 2000; Murray, Goldstein, Nourse, & Edgar, 2000; Werner, 1993), and those who do attend are less likely to graduate (Murray et al., 2000). Despite the continued challenges that accompany RD, many adults with RD are successful in their studies (Seo, Abbott, & Hawkins, 2008) and careers (Burns, Poikkeus, & Aro, 2013; Gerber, Ginsberg, & Reiff, 1992; Greenbaum, Graham, & Scales, 1995; Vogel & Adelman, 1992) and report satisfaction with their accomplishments and positions as adults (Rogan & Hartman, 1990). The intent of this dissertation is to examine factors that contribute to positive adjustment and educational outcomes of adults with RD.

Theoretical Framework

In a recent review of the impact of learning disabilities on adulthood, Gerber (2012) proffered issues holding back the field of learning disabilities in studying the topic of adulthood. One of these issues is the lack of a conceptual

model available to investigate the complexities of learning disabilities in adulthood. To situate the series of studies in this dissertation, a framework developed from the Multiple Systems Model of Reading (Parrila, 2008), coupled with the risk and resilience perspective (e.g., Margalit, 2003; Masten & Garmezy, 1985; Werner, 1993; Wong, 2003), is used. Both theories posit that people develop in a setting of interconnected systems.

The Multiple Systems Model of Reading. Parrila (2008) developed the Multiple Systems Model of Reading to account for the need to consider multiple developmental domains when examining risk and protective factors for individuals with reading disabilities. This meta-theory proposes bidirectional relationships between five systems—environment, psychological, behaviour, neural, and genetic—leading to reading and academic outcomes. In this dissertation, I examined two of these five systems, using resilience factors previously researched with learning disability populations to help inform what is known about adults with RD. In the psychological system, I examine social and personal competence, personal structure, and persistence, along with the number of difficulties reported in addition to RD. Within the environmental system, I examine family cohesion, perceived social support, social resources, social capital, and perceived community support. Each component is examined to identify how it jointly and uniquely relates to life satisfaction and academic achievement of adults with RD.

Risk and resilience. *Resilience* refers to a "dynamic process encompassing positive adaptation within the context of significant adversity"

(Luthar, Cicchetti, & Becker, 2000, p. 543). Resilience is comprised of risk and protective factors. *Risk factors* or "hazards, adverse circumstances, or negative events" (Spekman, Herman, & Vogel, 1993, p. 59) increase the likelihood of negative outcomes. Adults with RD are likely to continue to experience challenges in multiple domains throughout their life (Klein & Mannuzza, 2000; Malcolm et al., 1990). Thus, having RD may expose a person to unexpected difficulties, such as experiencing failure, frustration, or stressors in university or college, often without a peer group to understand and empathize with their experiences. Although exposure to risk increases the likelihood of experiencing negative outcomes, these are not certain; *protective factors*, those "that increase the likelihood of a positive developmental outcome despite exposure to risk" (Spekman, Herman et al., 1993, p. 59), can help buffer risk or enhance outcomes (see Murray, 2003, for a summary of risk and protective factors).

A foundational study examining protective factors is Werner's (1993) Kauai Longitudinal Study. In this prospective research, Werner followed 698 infants born in 1955 on the island of Kauai, through to adulthood and examined factors that aided at-risk children to become successful and resilient adults. Of these individuals, 22 were children with learning disabilities. From Werner's study and Garmezy's seminal research (e.g., Masten & Garmezy, 1985), categories of protective factors emerged: (a) individual attributes (intrapersonal factors), including temperament and effective use of personal skills and values, along with (b) supports within the family and (c) supports external to the family unit (interpersonal factors).

Risk and resilience theory emphasizes the importance of considering the interactions of systems of an individual (Margalit, 2003; Murray, 2003; Pianta & Walsh, 1998; Wong, 2003). Masten and Garmezy (1985) argued that "adaptation is an ongoing process of interactions between the systems of individual, family, social network, community, and society, that the individual's development is embedded in a complex context" (p. 36). Previous studies examining protective factors or the success of adults with learning disabilities further our understanding in this area, providing important contributions to the field (e.g., Burns et al., 2013; Gerber et al., 1992; Goldberg, Higgins, Raskind, & Herman, 2003; Greenbaum et al., 1995; Hutchinson, Freeman, Stoch, & Chan, 2004; Litner, Mann-Feder, & Guérard, 2005; Scott & Scherman, 1992; Spekman, Goldberg, & Herman, 1992). However, these studies provide little information regarding the relationships between and within intrapersonal and interpersonal resilience factors or the impact of these factors on positive outcomes. In 2003, drawing from previous research (e.g., Werner, 1993), Murray illustrated a model to understand the adult transitions of youth with high-incidence disabilities. This model emphasized how individual characteristics as well as experiences in multiple contexts can impact adjustment and helps guide the studies presented in this dissertation.

Purpose of Dissertation Studies

Although several intrapersonal and interpersonal protective factors are assumed to correspond with positive outcomes for adults with RD, there remain several unresolved issues. First, knowledge about protective factors is limited in relation to adults with RD. Many studies have examined individuals with learning

disabilities in general, rather than those with RD in particular. Conducting research with specific samples within the adult learning disabilities population is necessary to provide an understanding of the possibly specific protective factors for adults experiencing somewhat similar difficulties (Gajar, 1992). Second, according to Gerber (2012), many researchers select one or two variables to study, which tends to produce isolated studies, creating a disconnect across the extant literature. Although many reviews and commentaries about resilience and learning disabilities have emphasized the importance of examining multiple predictor and outcome variables (i.e., Margalit, 2003; Miller, 1996; Murray, 2003; Wong, 2003), limited empirical research is available that specifically examines the interrelations between protective factors from multiple domains. Consequently, to understand the complexities of resilience (Masten & Garmezy, 1985; Pianta & Walsh, 1998) and the outcomes of adults with RD (Parrila, 2008), researchers must investigate risk and protective factors in combination, using factors across multiple domains.

Not all adults who experience reading problems have been formally diagnosed with a reading disability. Thus, in the studies in this dissertation, adults with a history of reading difficulties (RD)—self-reported problems with reading and spelling, experienced currently or in the past—will be the focus. Researchers (e.g., Deacon, Cook, & Parrila, 2012; McGonnall, Parrila, & Deacon, 2007; Parrila, Georgiou, & Corkett, 2007; Schulte-Korne, Deimel, & Remschmidt, 1997) suggest that a self-report measure of RD is a viable alternative when formal diagnosis is not possible.

In the following section, study variables in this dissertation are described within the psychological and environmental domains outlined in Parrila's (2008) Multiple Systems Model of Reading and using multiple levels of analysis—individual, family and social network, and community—as recommended in the risk and resilience perspective (Masten & Garmezy, 1985).

Because "success" means different things to different people, researchers should consider multiple outcomes (Spekman, Goldberg, & Herman, 1993). Well-being and educational success have been used in previous research as indicators of successful adjustment (i.e., Hutchinson et al., 2004; Raskind, Goldberg, Higgins, & Herman, 1999; Scott & Scherman, 1992; Werner, 1993). In keeping with Spekman, Goldberg et al.'s (1993) recommendations, I examine *life satisfaction*, the cognitive appraisal of one's life based on judgment criteria established by the person (Diener, 2009) and *academic achievement*—participants' grade point average (GPA) at the time of the study—as outcome variables.

Psychological Domain Variables Examined

Individual factors. The extant literature examining positive outcomes for adults with learning disabilities, including RD, suggests several intrapersonal characteristics important for promoting successful outcomes. These include personal competence (Gerber et al., 1992; Goldberg et al., 2003), appropriate goal setting (Goldberg et al., 2003), persistence (Corkett, Hein, & Parrila, 2008; Gerber et al., 1992; Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Spekman et al., 1992), and social competence (Corkett et al., 2008).

A positive perception of self coincides with coping with a difficult situation, feeling in control of life's outcomes (Gerber et al., 1992; Werner, 1993), and is associated with successful adult adaptation (Werner, 1993). Competence in one's abilities and future plans assists adults with RD during their education (Corkett et al., 2008; Werner, 1993) and organization and planning positively impact well-being (Burns et al., 2013). Persistence—the "voluntary continuation of a goal-directed action in spite of obstacles, difficulties, or discouragement" (Peterson & Seligman, 2004, p. 229)—has been linked to higher life satisfaction (Singh & Jha, 2008) and GPA in samples without known RD (e.g., Duckworth, Peterson, Matthews, & Kelly, 2007; Houser-Marko & Sheldon, 2006). Successful adults with learning disabilities tend to push themselves, take more risks, and have more drive than those less successful (Gerber et al., 1992). Also, the ability to develop positive relationships appears to be a key characteristic of successful adults with learning disabilities (Gerber et al., 1992), helping adults with RD gain educational accommodations and information they may not have otherwise garnered (Corkett et al., 2008). In Chapter II, focus is on the intrapersonal factors of personal competence, structured style, social competence, and persistence in explaining life satisfaction and academic achievement for adults with RD and in relation to interpersonal factors of resilience, described below.

One individual level risk factor examined in this dissertation is the number of difficulties reported in addition to reading problems. People with RD are at higher risk for additional learning impairments (Goldston et al., 2007) because reading disability rarely appears in isolation (Willcutt & Pennington, 2000a).

People with comorbid problems also tend to have more secondary problems, including academic difficulties (Willcutt et al., 2007) and low perceived social support (Martínez, 2006), than those with a single problem (Raskind et al., 1999; Willcutt & Pennington, 2000b; in contrast, see Nelson & Gregg, 2012). It is believed that people with multiple disabilities must exert greater efforts to compensate for their learning deficits compared to those with a single impairment (Martínez & Semrud-Clikeman, 2004). In Chapter II, I examine number of difficulties in addition to RD in relation to intrapersonal and interpersonal factors in explaining life satisfaction and academic achievement. In Chapter III, I investigate three different models to understand the impact of number of difficulties, social support, and community support on life satisfaction and academic achievement.

Environmental Domain Variables Examined

The body of literature examining positive outcomes for adults with learning disabilities, including RD, has suggested several interpersonal factors important for promoting successful outcomes. These include social support (Corkett et al., 2008; Gerber et al., 1992; Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Spekman et al., 1992) and family environment (Werner, 1993). While examined less often than social support, support at the community level is also posited to have a positive impact on outcomes (Murray, 2003).

Social context. Perceived social support, "the extent to which an individual believes that his or her needs for support, information, and feedback are fulfilled" (Procidano & Heller, 1983, p. 2), has been found to associate

positively with life satisfaction (i.e., Herrero, Fuente, & Gracia, 2011; Yalçin, 2011) and grade point average (e.g., DeBerard, Spielmans, & Julka, 2004) for adults without RD. To our knowledge, the only study to examine social support and life satisfaction with adults with RD was done by Hellendoorn and Ruijssenaars (2000). They found that extensive parental support corresponded with better adjusted and more satisfied adults with dyslexia who had higher levels of education than those with less support. Chapter II examines the impact of social resources and family cohesion, and Chapter III the impact of close relationships—family, friends, significant others—on life satisfaction and academic achievement of adults with RD.

Extending research on perceived support, *social capital* refers to the combination of potential or actual resources linked to having a network of social ties (Briggs, 1998; Lin, 1999). *Personal social capital* involves resources and support found in close relationships, characterized by strong ties among members but with less new information being brought into the network for use compared with institutional social capital (Lee & Brinton, 1996; Stanton-Salazar, 2011). Notable social ties identified as positive factors in the existing literature are personal, including parents (e.g., Hellendoorn & Ruijssenaars, 2000), other family members (e.g., Corkett et al., 2008), and friends (e.g., Goldberg et al., 2003). In Chapter IV, I explore what social ties adults with RD report assisting them in achieving their goals.

Whereas *accessed social capital* refers to the availability of resources within one's social network (Lin, 1999), *mobilized social capital* is defined as

"the use of social contact and the resources provided by the contact" (Lin, 1999, p. 471). Research examining resources mobilized is sparse. Although Van Der Gaag and Snijders (2005) developed a Resource Generator that asked participants about access to a fixed list of resources, the resources listed could vary depending on characteristics and needs of the population surveyed, and they did not examine resource mobilization. In Chapter IV, I explore outlets available to adults with RD for developing social ties and the resources mobilized within personal and institutional social ties.

Finally, the status of one's social ties is believed important because social ties in higher occupational positions have access to more advantageous resources and connections than those in lower positions (Lin, 1999). For example, university graduates without RD who had social ties with higher socioeconomic status experienced employment success more often than graduates with lower SES ties (Jokisaari & Nurmi, 2005) and students with higher performing friends provide an upward pull to others in their group (Lomi, Snijders, Steglich, & Torló, 2011). In Chapter IV, I examine the impact of social ties' employment status or peer academic status on the academic achievement of adults with RD.

Community context. *Perceived community support* includes feelings of community belongingness, community involvement, and perceptions that resources are available in community organizations (Herrero & Gracia, 2007). In studies conducted with people without RD, perceptions of support from faculty (Yalçin, 2011), feelings of community belongingness (Herrero et al., 2011), and community participation (O'Connor & Jose, 2012) all correspond with higher

well-being, and community involvement has been linked to academic achievement (e.g., Schmidt, Shumow, & Kackar, 2007). In Chapter III, I examine the impact of community support on life satisfaction and academic achievement.

Institutional social capital involves support and resources offered by ties in institutional settings (Lee & Brinton, 1996; Stanton-Salazar, 2011) and is characterized by weak ties (Granovetter, 1973), bringing together people with diverse backgrounds and thus more new information than personal social capital. Institutional social ties include teachers (Morningstar, Turnbull, & Turnbull, 1995), professors (Greenbaum et al., 1995), classmates (Corkett et al., 2008), and tutors (Spekman et al., 1992). Youth and adults develop social ties in multiple community contexts, including in-class and on-line learning (Francescato, Mebane, Porcelli, Attanasio, & Pulino, 2007), volunteering (Kay & Bradbury, 2009), and participation on sports teams (Broh, 2002). In Chapter IV, I explore the institutional social ties that support adults with RD in meeting goals, outlets for developing ties, resources mobilized within these relationships, and the status of one's ties in relation to academic achievement.

Summary of Dissertation Goals

This dissertation consists of three separate studies examining different aspects of resilience of adults with RD. The goal of the first study (Chapter II) is to examine the effects of intrapersonal (personal competence, social competence, structured style, persistence) and interpersonal (family cohesion and social resources) protective factors on life satisfaction and academic achievement. The goal of the second study (Chapter III) is to test three different models to

understand the impact of number of difficulties, social support, and community support on life satisfaction and academic achievement. The goals of the third study (Chapter IV) are to (a) understand what social ties adults with RD report assisting them in achieving their goals, (b) explore outlets available to adults with RD for developing social ties, (c) determine the resources mobilized within personal and institutional social ties, and (d) examine the impact of social ties' status on academic achievement.

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CHAPTER II. USING A MULTIDIMENSIONAL MEASURE OF RESILIENCE TO EXPLAIN LIFE SATISFACTION AND ACADEMIC ACHIEVEMENT OF UNIVERSITY STUDENTS WITH READING DIFFICULTIES

An increasing number of adults with reading difficulties (RD) are enrolling in postsecondary institutions (Mull, Sitlington, & Alper, 2001). Although adults with RD are likely to continue to experience challenges in multiple domains throughout their life (Malcolm, Polatajko, & Simons, 1990), many report success in their life and academic pursuits (Gerber, Ginsberg, & Reiff, 1992; Greenbaum, Graham, & Scales, 1995). The body of literature examining positive outcomes for adults with learning disabilities (e.g., Burns, Poikkeus, & Aro, 2013; Corkett, Hein, & Parrila, 2008; Goldberg, Higgins, Raskind, & Herman, 2003; Hellendoorn & Ruijssenaars, 2000; Raskind, Goldberg, Higgins, & Herman, 1999; Spekman, Goldberg, & Herman, 1992) provides a foundation on which to extend the research on resilience of adults with RD. In particular, researchers (e.g., Gerber et al., 1992; Spekman, Goldberg, & Herman, 1993) have emphasized the importance of considering the interrelationships between the individual, family, social network, and community, noting, "the individual's development is embedded in a complex context" (Masten & Garmezy, 1985, p. 36). Yet, few studies have investigated factors related to success from a multidimensional viewpoint. We sought to extend this work by using intrapersonal and interpersonal factors to explain different aspects of life satisfaction and academic achievement for adults with RD.

Spekman, Goldberg et al. (1993) underscored key principles to which a model of resilience should adhere. They recommended that a framework be ecologically oriented, emphasizing that a combination of intrapersonal and interpersonal factors influence the outcomes of RD (see also Gerber et al., 1992, and Werner, 1993). Further, they suggested that emphasis be on protective factors and positive outcomes under the premise that because RD is life-long (Malcolm et al., 1990), attention should be devoted to helping people build skills and knowledge to cope with challenges. Finally, because "success" means different things to different people, multiple outcomes should be considered (Spekman, Goldberg et al., 1993).

In keeping with these recommendations, we examine intrapersonal and interpersonal factors to explain positive outcomes for adults with RD. One outcome used to indicate successful adjustment is well-being (i.e., Raskind et al., 1999; Scott & Scherman, 1992; Vogel & Adelman, 1990; Werner, 1993). A form of subjective well-being, life satisfaction is the cognitive appraisal of one's life based on judgment criteria established by the person (Diener, 2009). Life satisfaction has associated positively with self-esteem (Alfonso, Allison, Rader, & Gorman, 1996; Hinterman, Burns, Hopwood, & Rogers, 2012) and coping resources (Matheny et al., 2002), and negatively with depression (Hinterman et al., 2012). We examine life satisfaction domains of general satisfaction, social satisfaction, and self satisfaction. A second oft-cited outcome is educational success (see Hutchinson, Freeman, Stoch, & Chan, 2004; Raskind et al., 1999;

Scott & Scherman, 1992; Vogel & Adelman, 1990; Werner, 1993). We use grade point average as a measure of academic achievement.

Multiple Indicators of Resilience

Resilience is a "dynamic process encompassing positive adaptation within the context of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p. 543). Being resistant to stress may mean "a life with graduated challenges that enhance the development of mastery skills, flexible coping strategies, and adaptive personality attributes," rather than avoiding adversity altogether (Masten & Garmezy, 1985, p. 13). Risk factors (e.g., adverse circumstances, negative events) increase the likelihood of negative outcomes (Spekman, Herman, & Vogel, 1993). Individuals with RD are at increased risk for encountering less desirable outcomes: Having RD may expose adults to unexpected failure, frustration, or stress in university or college, often without a peer group to empathize with their experiences. Having RD, however, does not mean negative outcomes are certain. Protective factors "increase the likelihood of a positive developmental outcome despite exposure to risk" (Spekman, Herman et al., 1993, p. 59) and can buffer risk or enhance outcomes. Protective factors have been widely researched in non-RD populations (Masten & Garmezy, 1985); less is known about their impact on success for adults with RD. Categories of protective factors include (a) dispositional characteristics and effective use of personal skills (Goldberg et al., 2003; Hutchinson et al., 2004; Werner, 1993), or intrapersonal factors, along with (b) supports within the family and (c) supports external to the family, or interpersonal factors (Masten & Garmezy, 1985; Werner, 1993).

Intrapersonal factors. Personal competence, structured style, social competence, and persistence are of particular interest in this study. Perception of self or confidence in personal strengths, including the ability to solve problems, make decisions, and approach challenges (Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003) is one component of personal competence. A positive perception of self coincides with coping with a difficult situation and feeling in control of life's outcomes (Gerber et al., 1992; Werner, 1993). Adolescent positive self-concept and internal locus of control were strongly linked to successful adult adaptation in Werner's (1993) study. A second component of personal competence is positive perceptions of the future (Friborg et al., 2003). In Werner's (1993) study, resilient youth displayed an achievement-oriented attitude toward life and as adults exceeded the educational and vocational accomplishments of their high-risk peers. Competence in one's abilities and future plans has been found to assist adults with RD during their education. In Corkett et al.'s (2008) study, adults with RD reported that believing in themselves kept them focused on their goals—it was not a matter of whether these adults would attend university, but a matter of when they would go.

Structured style refers to one's ability to organize, plan, and uphold daily routines (Friborg et al., 2003). Planfulness of daily activities has been linked to psychological adjustment. Compared to people at risk for depression, those not at risk planned their days more carefully and carried out their social and academic plans more fully, which in turn made them feel better about themselves, less anxious, and more optimistic about how their life would play out the following

day (Nezlek, 2001). These findings suggest that organization and planning have a positive impact on well-being (Burns et al., 2013).

Social competence describes skills relevant for initiating and maintaining social relationships, including cooperation, trust, and communication (Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2005). The ability to develop positive relationships appears to be a key characteristic of successful adults with learning disabilities (Gerber et al., 1992). Building rapport with teachers and professors helped adults with RD gain educational accommodations and information they may not have otherwise garnered (Corkett et al., 2008). Some adults with learning disabilities experience successful social interactions (Gerber et al., 1992; Greenbaum et al., 1995), while others have problems developing and maintaining relationships (Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Litner, Mann-Feder, & Guérard, 2005).

In interviews with adults with learning disabilities, persistence has emerged as a key intrapersonal component for success during postsecondary education (Corkett et al., 2008; Greenbaum et al., 1995; Litner et al., 2005) and in adulthood (Burns et al., 2013; Gerber et al., 1992; Goldberg et al., 2003; Hellendoorn & Ruijssenarrs, 2000; Scott & Scherman, 1992). Persistence refers here to the "voluntary continuation of a goal-directed action in spite of obstacles, difficulties, or discouragement" (Peterson & Seligman, 2004, p. 229), and has been linked to higher life satisfaction (Singh & Jha, 2008) and GPA in samples without known RD (e.g., Duckworth, Peterson, Matthews, & Kelly, 2007; Houser-Marko & Sheldon, 2006). When faced with a difficult task, many adults

with RD report working hard to achieve their goals and an unwillingness to give up (Corkett et al., 2008; Hellendoorn & Ruijssenaars, 2000). Successful adults with learning disabilities tend to push themselves, take more risks, and have more drive than those less successful (Gerber et al., 1992).

Interpersonal protective factors. In this study, we focus on family cohesion and social resources found within friend and family relationships. Family cohesion is "the emotional bonding that family members have toward one another" (Olson, Russell, & Sprenkle, 1983, p. 69). Openness, warmth, flexibility, and emotional connectedness characterize cohesive families (Richmond & Stocker, 2006). An increasing body of research demonstrates that family cohesion in non-RD populations corresponds to positive outcomes, including positive psychological adjustment (Richmond & Stocker, 2006) and well-being in university-aged students (Uruk, Sayger, & Cogdal, 2007), a greater ability to build personal and professional relationships (Gorbett & Kruczek, 2008), and higher academic performance (Walker & Satterwhite, 2002).

Having social resources including friends or family available to discuss personal issues, provide encouragement, and offer general support is a feature of resilient individuals. Support is believed to contribute to positive outcomes for adults with learning disabilities, including RD (e.g., Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Hutchinson et al., 2004; Raskind et al., 1999; Spekman et al., 1992; Werner, 1993), and is seen as a way to compensate for difficulties (Burns et al., 2013; Corkett et al., 2008). For adults with dyslexia,

parental support was associated with life satisfaction and social well-being (Hellendoorn & Ruijssenaars, 2000).

Number of Difficulties in Addition to RD

Because reading disability seldom appears in isolation, people with RD are at risk for additional learning impairments (Willcutt et al., 2007) and secondary problems (Raskind et al., 1999). Those with RD and an additional difficulty tend to exhibit more academic and social difficulties (Willcutt et al., 2007), and score higher in sense of inadequacy and lower in perceived social support than those with one or no learning disability (Martínez, 2006). These findings suggest students with multiple disabilities are at increased risk for negative outcomes as young adults (Willcutt et al., 2007).

Current Study

Several qualitative studies have focused on success attributes of adults with learning or reading disabilities (i.e., Burns et al., 2013; Gerber et al., 1992; Goldberg et al., 2003; Greenbaum et al., 1995; Hutchinson et al., 2004; Litner et al., 2005; Scott & Scherman, 1992; Spekman et al., 1992). Although these studies further our understanding, mere identification does not tell us about the relations between and within intrapersonal and interpersonal domains, and whether these factors explain positive outcomes. Few studies (i.e., Raskind et al., 1999; Werner, 1993) have used quantitative analyses to explore the impact of protective factors on outcomes of adults with learning disabilities. Even fewer (i.e., Hellendoorn & Ruijssenaars, 2000) have focused on the impact of these factors on outcomes particularly with adults with RD. Hellendoorn and Ruijssenaars (2000)

interviewed 27 adults with dyslexia and converted interview categories into nominal and ordinal variables to explain acceptance of dyslexia, severity of socioemotional problems, and life satisfaction. Our study extends Hellendoorn and Ruijssenaars' study by (a) examining different aspects of life satisfaction and academic achievement, (b) using factors commonly found in the literature, (c) analyzing data with a larger sample (i.e., 120 vs. 27), and (d) using established measures of resilience, persistence, and life satisfaction. Further, although many adults with RD have difficulties in addition to RD (Willcutt et al., 2007), the impact of the number of difficulties on outcomes has been overlooked.

The present study sought to address these limitations by examining if intrapersonal factors (i.e., persistence, personal competence, structured style, and social competence) and interpersonal factors (i.e., family cohesion and social resources) influence life satisfaction and academic achievement for adults with RD. We expect (a) intrapersonal factors to explain self satisfaction, (b) interpersonal factors to explain social satisfaction, (c) intrapersonal and interpersonal factors to explain general satisfaction, (d) intrapersonal and interpersonal factors to explain academic achievement, and (e) the number of difficulties reported in addition to RD to negatively relate to general, self, and social satisfaction and academic achievement.

Method

Procedure

We recruited participants in two ways. Participants who completed the paper-and-pencil survey in the reading lab at a large Canadian university (64.5%)

were recruited through in-class announcements, departmental listservs, posters on campus, and the on-campus student disability centre. Interested participants contacted the first author to set up a time to visit the reading lab to complete the screening measure (Adult Reading History Questionnaire-Revised, see below) and surveys. Participants who completed the survey online (35.5%) were recruited through student disability centres in degree-granting Canadian universities. We emailed centre coordinators who distributed study information to potential participants at their centres. Interested participants emailed the first author to obtain a link to the study information, screening measure, and surveys.

The online survey was a simple translation of the paper-and-pencil counterpart. Current literature examining web-based versus paper-and-pencil surveys suggests completing a survey online does not result in major measurement differences (e.g., Cole, Bedeian, & Field, 2006). We conducted bivariate analyses to examine demographic characteristics and independent variables between samples. P values were generated based on chi square or t-values with Bonferroni adjustment ($p < .0028$). Lab participants were younger ($M = 23.4$, $SD = 5.7$) than online participants ($M = 30.0$, $SD = 11.1$), $t(119) = 4.37$, $p < .001$, and reported fewer difficulties in addition to RD (2.9) than did online participants (5.1), $t(119) = 5.02$, $p < .001$. We used combined sample data for the remaining analyses, controlling for age and number of difficulties.

Participants

Participants with self-reported RD included 120 individuals (71% women) in multiple disciplines (e.g., arts, science, education, medicine) who either were

completing a university degree or were recent graduates at the time of data collection. Participants were 18–58 years of age (M = 25.7, SD = 8.5). All participants reported English as their first language. Most participants' parents (60% mothers, 68% fathers) completed some type of postsecondary education. Participants reported reading difficulties present among family members: 42.1% reported a parent had a difficulty, 28.3% reported a sibling had a difficulty, and 22.3% reported an extended family member had a difficulty; 62% named at least one of the three.

Measures

History of reading difficulty. We used the Adult Reading History Questionnaire-Revised (Parrila, Corkett, Kirby, & Hein, 2003; see also Deacon, Cook, & Parrila, 2012) to determine self-reported RD. The Elementary School Difficulties scale (8 items; α = .88) asks about reading difficulties participants experienced as children (e.g., amount of difficulty learning to read). Similar questions are asked on the Current Difficulties scale (12 items; α = .79), with additional questions about reading for courses and time spent reading textbook chapters. Items are rated using a 5-point Likert scale (0 to 4), with higher scores indicating more difficulty with reading skills. Responses for each section were totalled and divided by the maximum possible score for the scale; thus, the lowest possible scale score was 0 and the highest was 1. The mean was 0.58 (SD = 0.22, range = 0.06–1.00) for elementary school RD and 0.58 (SD = 0.15, range = 0.20–0.96) for current RD. To determine a history of RD, we used a scale score of 0.45 as a cutoff on either elementary or current RD: 14.2% (n = 17) scored above the

cutoff only on elementary school difficulties, 26.7% (*n* = 32) only on current difficulties, and 59.2% (*n* = 71) scored at or above 0.45 on both scales. Scales were moderately correlated, $r = .24$, $p = .009$.

Resilience. The Resilience Scale for Adults (Friborg et al., 2003) is a 33-item measure with six domains: perceptions of self (6 items; $\alpha = .83$), perceptions of future (4 items; $\alpha = .83$), structured style (4 items; $\alpha = .63$), social competence (6 items; $\alpha = .82$), family cohesion (6 items; $\alpha = .89$), and social resources (7 items; $\alpha = .80$). To limit acquiescence bias, the measure uses a semantic differential response format, placing positive and negative adjectives to the right for every second item. Scores can range from 33 to 231; higher scores indicate higher resilience.

Persistence. The Work Habits Questionnaire (Parrila & Stack-Cutler, 2008) is a 15-item measure of persistence rated using a 5-point Likert scale (1 = *never/rarely* to 5 = *always*). The measure was developed by adapting questions from a persistence scale for children (i.e., Lufi & Cohen, 1987) and older persistence measures used with adults (i.e., Mukherjee, 1974; Wang, 1932). Higher scores indicate greater persistence, with scores ranging from 15 to 75. Three items are reverse coded to avoid response bias. The measure was piloted with two samples: undergraduate students enrolled in an educational psychology course at a large university in Western Canada (*n* = 125) and undergraduate students with and without self-reported RD from a university/college in Western Canada (*n* = 109). Five items from the original 20-item measure that had low correlations with the other items were removed. Cronbach's alpha was acceptable

for each pilot group, $\alpha = 0.85$ and $\alpha = 0.91$, respectively, as well as in the current study, $\alpha = 0.89$.

Number of difficulties. To examine the number of difficulties reported in addition to RD, participants received a prompt: "In addition to experiencing difficulties with reading and/or spelling, please circle any other difficulties you may experience." They selected from a list of 12 difficulties and were provided two spaces to list difficulties not mentioned. Most participants (92%) reported having at least one difficulty in addition to RD, with 58% noting two to four: distractibility (48%), writing (47%), memory (41%), mathematics (41%), attention (35%), speaking (31%), fine motor skills (24%), listening (23%), auditory (20%), impulsivity (13%), coordination (10%), and hyperactivity (7%).

Life satisfaction. The Extended Satisfaction with Life Scale (Alfonso et al., 1996) assesses nine life satisfaction domains. We selected three domains relevant to adult postsecondary students or recent graduates: general ($\alpha = .93$; e.g., "I am satisfied with my life"), self ($\alpha = .92$; e.g., "I am generally pleased with myself as an individual"), and social ($\alpha = .96$; e.g., "In most ways my social life is close to my ideal") satisfaction. Each domain has 5 items. Participants indicated level of agreement using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*); higher scores indicate greater satisfaction.

Academic achievement. We used grade point average (GPA) to provide a broad measure of academic achievement across a range of courses. Students reported their overall GPA as well as grades from the three most recent courses they completed, which we computed into an average grade. Because participants

attended universities across Canada, if GPA and grades were reported using a scale other than a percent, they were converted to a percent using the guidelines from individual university websites. Fourteen participants did not indicate a GPA, but did list their last three grades. Because GPA and the average of the last three grades correlated positively, $r = .69$ ($p < .001$), the average of the last three grades was used in place of GPA. Of those with academic achievement data ($n = 111$), over one-third ($n = 44$, 39.6%) reported an academic achievement average of 70–79%, nearly one-third ($n = 33$, 29.7%) an average of 80–89%, and more than a quarter ($n = 29$, 26.1%) an average of 60–69%. Only a few participants reported an average of 50–59% ($n = 4$, 3.6%) or 90% or higher ($n = 1$, 0.9%).

Statistical Analyses

We conducted descriptive analyses using SPSS 20. Pearson correlations were used to examine the strength and direction of relationships between variables. To examine these relationships further, we conducted structural equation modeling (SEM) using AMOS 20. We modeled persistence, number of difficulties, age, life satisfaction, and academic achievement as observed variables and resilience factors as latent variables.

A minimum sample size of 100 is recommended to conduct SEM (Kline, 2011), and the participants-to-parameter ratio should be no less than 5:1. Our sample size met these criteria. We used multiple fit indices when evaluating our model. Traditional χ^2 and Bollen-Stine bootstrap p values of .05 or greater, chi-square/degree of freedom values less than 3, standardized root mean square residual (SRMR) values less than .80, and Comparative Fit Index (CFI) values of

.95 or above indicate good fit of the model to the data. As per recommendations in the SEM literature (i.e., McDonald & Ho, 2002; Mueller & Hancock, 2007), we used CFI in combination with SRMR, indices that estimate model fit well even in smaller samples (Hu & Bentler, 1999).

We used Maximum Likelihood estimation, which provides unbiased, reliable, and efficient parameter estimates and a test statistic for evaluating fit (Nevitt & Hancock, 2001). Non-normality has little impact on model parameter estimates when using Maximum Likelihood estimation; however, problems may arise when estimating parameter standard errors and test statistics (Bentler & Yuan, 1999). Bootstrap resampling can help manage non-normality when conducting SEM. Using this approach by randomly drawing multiple subsamples, with replacement, from the parent sample establishes an empirical sampling distribution (Nevitt & Hancock, 2001). We used standard bootstrapping technique to assess parameter estimate fit using 500 samples (see Bollen & Stine, 1992) and Bollen-Stine analysis to assess model fit.

Prior to analyses, we examined data for outliers, missing values, and normality. Seven outliers on the RSA were winsorized (Duan, 1999). One multivariate outlier was detected using Mahalanobis distance and the case was removed. Six participants (5% of cases) had missing data: three participants were missing one item and three participants were missing two items from the measures used in this study. One value (.06%) was missing on the ESWLS, five values (.13%) on the RSA, and three values (.17%) on the persistence measure. The total percent of missing data was low (.36%) and random, so we used Ipsative

mean substitution (Präg, 2007). Examination of the distribution's normality of the persistence scale, resilience scales, and life satisfaction scales revealed deviations. The Mardia test yielded a statistically significant result, indicating multivariate kurtosis. Transformations resulted in lowered multivariate kurtosis; however, because the data were still not multivariate normal, we used Maximum Likelihood estimation with bootstrap resampling, which yielded meaningful solutions in all 500 instances.

Results

Descriptive Statistics and Correlations

Table 1 presents descriptive statistics and correlations for study variables. Resilience scales correlated significantly, except for structured style and social competence (see Friborg et al., 2005). Life satisfaction scales correlated significantly, the largest association being between self and general satisfaction (see Alfonso et al., 1996). Correlations suggested also that for the most part, higher levels of resilience corresponded to higher life satisfaction estimates. Persistence correlated positively with the resilience scales of perceptions of self, perceptions of future, and structured style as well as self satisfaction. Number of difficulties associated negatively with all resilience scales except social competence, and with general satisfaction, indicating that those who reported a greater number of difficulties in addition to RD had significantly lower resilience scores (with the exception of social competence) and general satisfaction. Age did not correlate with any study variable. Because academic achievement did not correlate with any other variable, we did not consider it further.

Confirmatory Factor Analysis of the Resilience Scale for Adults Scales

We performed confirmatory factor analysis to test whether a one-factor or two-factor model would better reflect the structure of resilience as measured with the six subscales of the Resilience Scale for Adults. The one-factor model did not fit the data well: $\chi^2(9) = 43.06$, $p < .001$; $\chi^2/df = 4.79$; Bollen-Stine $p = .002$; CFI = .82; SRMR = .08. We then tested a two-factor model, modeling intrapersonal resilience as a latent factor with four observed variables (perceptions of self, perceptions of future, structured style, and social competence) and interpersonal resilience as a latent factor with two observed variables (social resources and family cohesion). While this model fit the data better than the one-factor model, it still did not fit the data well: $\chi^2(8) = 21.78$, $p = .005$; $\chi^2/df = 2.72$; Bollen-Stine $p = .022$; CFI = .93; SRMR = .07. Therefore, we tested an alternative two-factor model, loading social competence with interpersonal resilience as suggested by modification indices and correlations. This model fit the data well: $\chi^2(8) = 8.91$, $p = .350$; $\chi^2/df = 1.11$; Bollen-Stine $p = .393$; CFI = 1.00; SRMR = .04.

Testing Life Satisfaction SEM Models

Because our sample size is small to medium (see Kline, 2011), we tested three separate models to explain the three life satisfaction domains. In all models (see below), intrapersonal resilience associated positively with interpersonal resilience and persistence, and both resilience factors related negatively to number of difficulties.

General satisfaction. Figure 1 shows a parsimonious model of general satisfaction with intrapersonal resilience, interpersonal resilience, persistence,

number of difficulties, and age. A model including all significant paths fit the data well: $\chi^2(32) = 46.10$, $p = .051$; $\chi^2/df = 1.44$; Bollen-Stine $p = .142$; CFI = .95; SRMR = .07. The model accounted for 38% of the variance in general satisfaction. Findings showed that (a) intrapersonal resilience explained general satisfaction and (b) number of difficulties did not explain general satisfaction.

Self satisfaction. Figure 2 shows a parsimonious model of self satisfaction with intrapersonal resilience, interpersonal resilience, persistence, number of difficulties, and age. A model including all significant paths fit the data reasonably well, $\chi^2(32) = 49.96$, $p = .023$; $\chi^2/df = 1.56$; Bollen-Stine $p = .086$; CFI = .94; SRMR = .07, accounting for 47% of the variance in self satisfaction. The findings indicated that (a) intrapersonal resilience explained self satisfaction and (b) number of difficulties explained self satisfaction. It should be noted that although the direct path coefficient between number of difficulties and self satisfaction was positive ($\beta = .21$, $p = .017$), the total effect estimated in the model between number of difficulties and self satisfaction was negative when the negative correlation ($\beta = -.42$, $p < .001$) between the independent variables was taken into account.

Social satisfaction. Figure 3 shows a parsimonious model of social satisfaction with intrapersonal resilience, interpersonal resilience, persistence, number of difficulties, and age. Upon examination of modification indices of the full model, we added a path between social competence and social satisfaction post hoc to improve model fit. The significant path coefficient ($\beta = .31$, $p = .001$) indicated a link between social competence and social satisfaction. A model

including all significant paths adequately fit the data, $\chi^2(31) = 49.43$, $p = .019$; $\chi^2/df = 1.59$; Bollen-Stine $p = .084$; CFI = .93; SRMR = .07, accounting for 30% of the variance in social satisfaction. The findings showed that (a) interpersonal resilience explained social satisfaction, (b) social competence explained social satisfaction, and (c) number of difficulties did not explain social satisfaction. The link between social competence and social satisfaction was so strong it went beyond the effect of the interpersonal resilience factor.

To ensure our bootstrapping models were stable and unbiased, we compared the original sample weights (unstandardized and standardized) with the mean weights of the bootstrap samples to ensure these did not dramatically differ (see Ievers-Landis, Burant, & Hazen, 2011). The path differences (bias) were small for each of the models. We then compared the standard error (SE) of the mean bootstrap from all 500 samples with the SE-Bias between the original model and bootstrap samples. In each case, the SE-Bias was less than the SE in all three life satisfaction models, indicating that the paths/covariances/correlations were stable and unbiased.

Discussion

The purpose of our study was to examine the impact of intrapersonal and interpersonal factors on life satisfaction and academic achievement for adults with RD. Resilience is a multidimensional phenomenon (Masten & Garmezy, 1985), encompassing different, yet related dimensions. In the current study, intrapersonal and interpersonal resilience were positively related, indicating that adults with RD who experience factors in one domain likely experience factors in

other domains, similar to previous research (i.e., Hutchinson et al., 2004; Werner, 1993). However, we found that the two resilience factors were important in explaining different life satisfaction domains. Consistent with previous research in which self-esteem, an intrapersonal component, positively corresponded with self satisfaction (Alfonso et al, 1996), we found that intrapersonal resilience explained general and self satisfaction. Interpersonal resilience, and social competence in particular, explained social satisfaction.

Growing evidence suggests persistence is an important characteristic of successful adults with RD (e.g., Gerber et al., 1992; Raskind et al., 1999; Spekman et al., 1992). In our study, the significant link between persistence and intrapersonal resilience suggests that adults with RD who persist in meeting their goals likely believe in their abilities and engage in planning and organization to elicit positive outcomes. Although a weak correlation (r = .26, p = .004) existed between persistence and self satisfaction, persistence did not significantly explain any life satisfaction variables in SEM analyses. There has been mention in several studies of students with learning disabilities reporting that the source of their persistence was pressure from punitive parents (Litner et al., 2005), anger to prove others wrong (Greenbaum et al. (1995), and drive to challenge others' expectations (Corkett et al., 2008). However, there is a paucity of research examining the potential negative force behind persistence. Although in these instances reacting to others' demands or needing to prove others wrong activates persistence, it is difficult to say how this type of persistence influences the life satisfaction for these individuals.

The number of difficulties reported in addition to RD corresponded negatively to intrapersonal and interpersonal resilience, suggesting adults with RD reporting a greater number of additional difficulties have less access to sources of intrapersonal and interpersonal resilience than adults reporting fewer difficulties. This finding is consistent with the results reported by Martínez (2006) who found students with RD and an additional difficulty scored higher in sense of inadequacy and lower in perceived social support than those with one or no learning disability. Further, 48% of participants reported experiencing distractibility, 35% attention difficulty, 13% impulsivity, and 7% hyperactivity in the current study. Students with attention difficulties in addition to RD may have problems in multiple skills demanded by postsecondary education (e.g., organization, social skills, self-esteem; Kaminski, Turnock, Rosén, & Laster, 2006). In relation to life satisfaction outcomes, number of difficulties associated negatively with life satisfaction domains, suggesting adults with RD reporting a greater number of difficulties are less satisfied. It is possible, however, that these adults have access to the same resources as those with fewer difficulties, but perceive them as insufficient, or they are quicker to bring to mind difficulties. Because we did not measure severity of difficulties reported, limited conclusions can be drawn.

Intrapersonal and interpersonal factors, including persistence, have been considered important for educational success for adults with RD in several qualitative studies (e.g., Corkett et al., 2008; Goldberg et al., 2003). In this study, academic achievement per se was not explained by resilience or persistence. A

possible explanation is that measurement discrepancies across studies result in differences in findings (Robbins, Lauver, Le, Davis, & Langley, 2004). While we used GPA as a proxy for educational success, other studies have evaluated success based on degree completion (Vogel & Adelman, 1990), highest education level achieved (Raskind et al., 1999), a 3.0 GPA or better (Scott & Scherman, 1992), or asking participants what helped them most during college (Greenbaum et al., 1995). Further, because GPA is a narrow criterion for success, broad predictors, such as social support, are less likely to predict narrow criteria than would a narrow predictor such as academic self-efficacy (Robbins et al., 2004).

It is surprising, however, that in the current study persistence and intrapersonal resilience did not explain academic achievement, unlike in previous research (e.g., Duckworth et al., 2007; Houser-Marko & Sheldon, 2006). One explanation can be taken from Duckworth et al.'s (2007) finding that when using SAT scores as a measure of general mental ability, students with lower ability reported higher persistence, indicating that lower ability students may compensate by working harder. In the current study, however, there is no connection—negative or positive—between persistence and academic achievement, suggesting that some lower GPA students persist, while others do not. A second explanation is that a right gauge of success for adults with RD may well be continuing studies after secondary school. In this case, all participants in our sample would be considered successful. Further, unlike in previous studies with adults without RD (e.g., Duckworth et al., 2007; Houser-Marko & Sheldon, 2006), persisting until graduation may a better measure of success for adults with RD than GPA. Future

research should include samples of adults with RD who did not continue studies past secondary school and those who pursued postsecondary studies, but then dropped out before graduating.

Our findings should be viewed in light of previous research on adult students with learning disabilities (LD), including RD. Several studies suggest challenges associated with learning difficulties may decrease in adulthood, especially for adults who have finished schooling. For example, adults with LD felt that stress due to their disability reduced as they got older (Raskind et al., 1999) and they succeeded better in school as they aged (Ingesson, 2007). Two-thirds of the adults in Ingesson's (2007) study felt their difficulties no longer affected them, with the exception of reading and writing activities, now that they were adults. Several reasons have been proposed for feeling less stress from LD in adulthood: successful adults compartmentalize their LD (Goldberg et al., 2003), improved adaptation with age may correspond with greater acknowledgement of limitations and increased use of coping strategies (Ingesson, 2007), and adults may be better able to make education decisions based on their abilities and interests (Raskind et al., 1999), arranging their lives so they do not have to often perform activities in which they experience difficulties (Goldberg et al., 2003).

In contrast, a recent meta-analysis suggested that challenges associated with LD continue into adulthood, reporting that compared to peers without LD, adult students with LD scored higher on levels of internalizing disorders (Klassen, Tze, & Hannok, 2013). Similarly, most adults in Ingesson's (2007) study acknowledged that having dyslexia influenced their school achievement and those

still in school were less optimistic about their future than adults who had left school, including the unemployed (Ingesson, 2007). Klassen et al. (2013) found that adult students with LD did not differ on levels of internalizing disorders compared to adults with LD in the general population. Given conflicting findings in previous research, it is not clear to what extent challenges associated with LD, including RD, are limited to the school context. Because most participants in our study were completing their degree, it is possible that our findings are unique to the school context and that certain stresses may abate following degree completion.

Some limitations to the current study should be acknowledged. First, although a meta-analysis showed that self-reported GPA correlated highly with GPA obtained from official college records, lower academic performance has been associated with lower reliability in self-reported GPA (Kuncel, Credé, & Thomas, 2005). Because some research has found that adults with learning difficulties have significantly lower GPA than students in the general population (Vogel & Adelman, 1990), caution is advised when including self-reported GPA in analyses. Future research may include self-reported GPA in addition to other variables, such as retention rates and highest level of education attained, to enable a thorough examination of educational outcomes explained by resilience factors. Second, although we included the number of difficulties reported in addition to RD in the analyses, we did not measure severity of reported difficulties and only a small number of participants reported each type of difficulty, which prohibited group comparisons. One or both of these factors could have a greater negative

impact on life satisfaction and academic outcomes than measuring the number reported (see Hellendoorn & Ruijssenaars, 2000). Future research may wish to examine subgroups of adults with RD reporting homogeneous difficulties in addition to RD and the impact of the severity of these difficulties on well-being and academic outcomes.

Given adults with learning disabilities often experience psychosocial problems, including developing and maintaining social contacts (e.g., Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000), it seems important for postsecondary institutions to be aware of the association between social competence, social relations, intrapersonal skills—how students view their personal competence and future opportunities—and life satisfaction. Interventions could focus on strategies for success in multiple domains including developing strong support networks, strengthening family relations, and improving social interaction skills. Further, an important aspect of students' general and self satisfaction to consider when working with adults with RD is their intrapersonal resources including setting goals, planning tasks, and holding positive perceptions of their current skills and future opportunities. Finally, professionals working with adults with RD should obtain information of the number of difficulties these adults report in addition to RD because those reporting multiple difficulties could be at greater risk of having lower intrapersonal and interpersonal resources available to them and lower life satisfaction compared to those reporting fewer difficulties.

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Table 2-1

Means, Standard Deviations, and Correlations Among Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Age	1.00												
2 Number of difficulties	.10	1.00											
3 Persistence	.08	-.00	1.00										
4 Perceptions of self	.07	-.31**	.33***	1.00									
5 Perceptions of future	.09	-.33***	.21*	.63***	1.00								
6 Social competence	-.15	-.10	.03	.34***	.28**	1.00							
7 Structured style	.16	-.29**	.29**	.29**	.37***	.03	1.00						
8 Family cohesion	-.09	-.26**	.05	.38***	.34***	.27**	.19*	1.00					
9 Social resources	.03	-.20*	.17	.42***	.40***	.49***	.23*	.60***	1.00				
10 General satisfaction	-.08	-.36***	.14	.46***	.46***	.21*	.30**	.42***	.36***	1.00			
11 Self satisfaction	-.05	-.12	.26**	.58***	.38***	.34***	.23*	.29**	.44***	.68***	1.00		
12 Social satisfaction	-.09	-.18	.04	.24**	.13	.47***	-.01	.21*	.47***	.41***	.42***	1.00	
13 Academic achievement[a]	-.03	-.10	.02	-.05	-.07	.03	.05	.03	.01	-.01	-.02	.04	1.00
M	25.67	3.68	3.76	4.86	5.24	5.20	4.71	5.02	5.80	5.07	4.94	4.59	73.89
SD	8.54	2.55	0.64	1.22	1.40	1.19	1.25	1.36	0.92	1.40	1.23	1.54	8.14

Note. Variables 4–9 = Resilience Scale for Adults; variables 10–12 = Extended Satisfaction with Life Scale.

[a] $n = 111$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

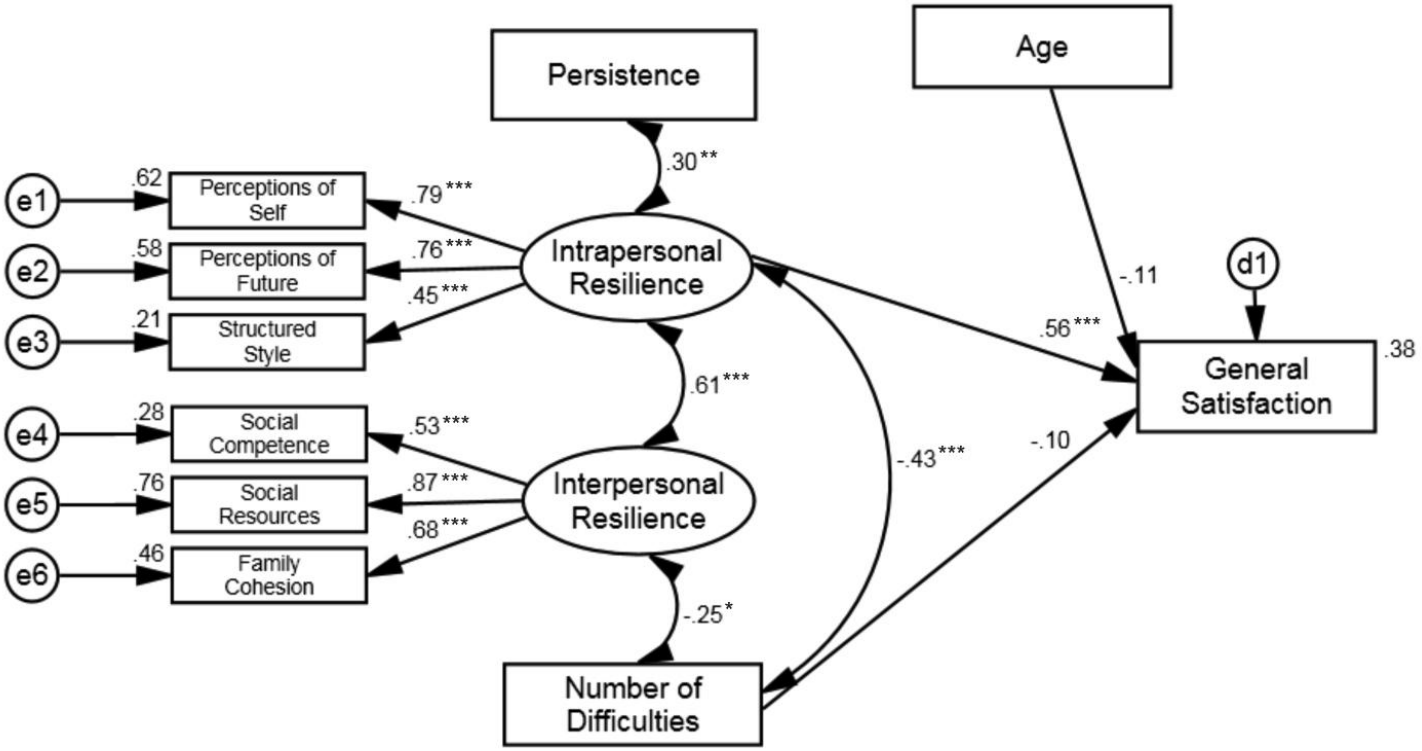

Figure 2-1. Persistence and Resilience Factors on General Satisfaction, Controlling for Number of Difficulties and Age.
Note. Path coefficients are standardized and significant at ***p < .001, **p < .01, *p < .05.
Ovals represent latent variables; rectangles represent observed variables.

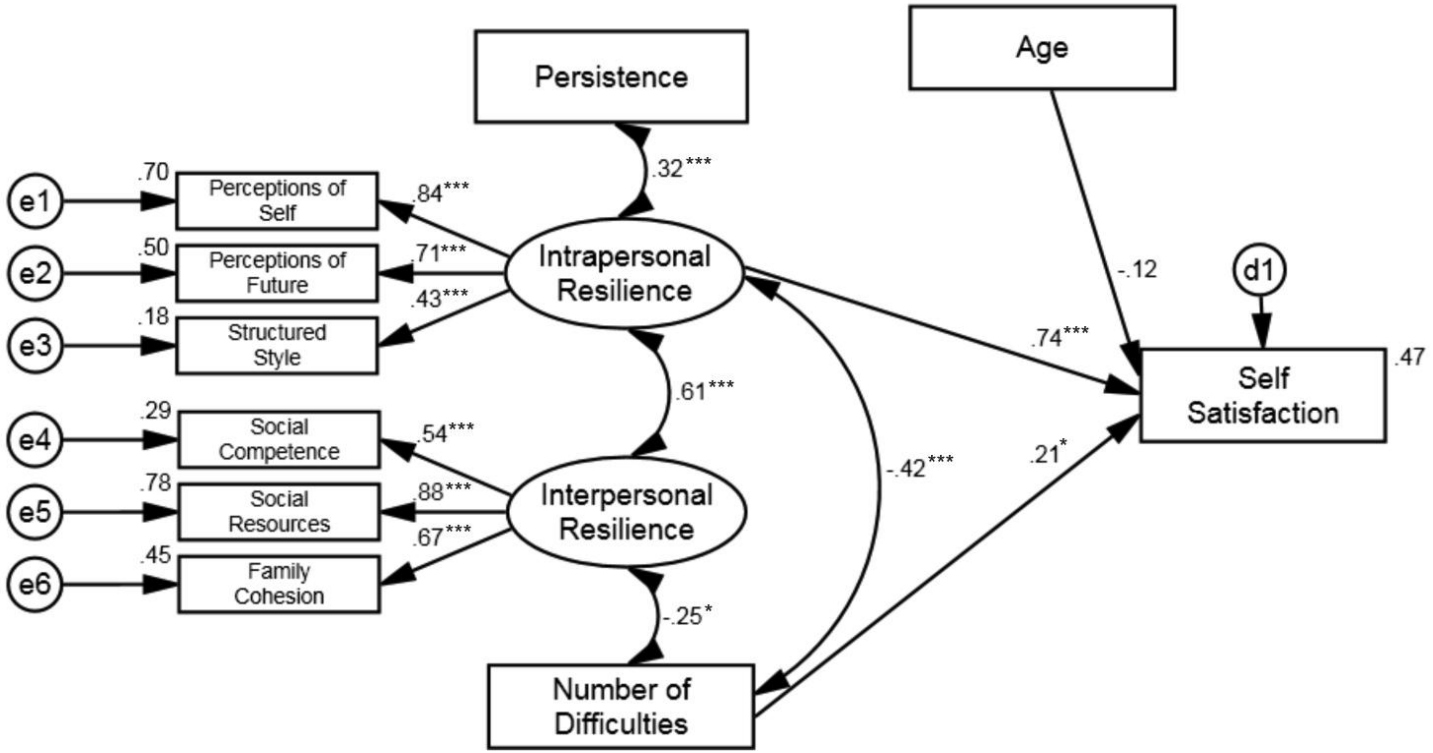

Figure 2-2. Persistence and Resilience Factors on Self Satisfaction, Controlling for Number of Difficulties and Age.
Note. Path coefficients are standardized and significant at ***p < .001, *p < .05.
Ovals represent latent variables; rectangles represent observed variables.

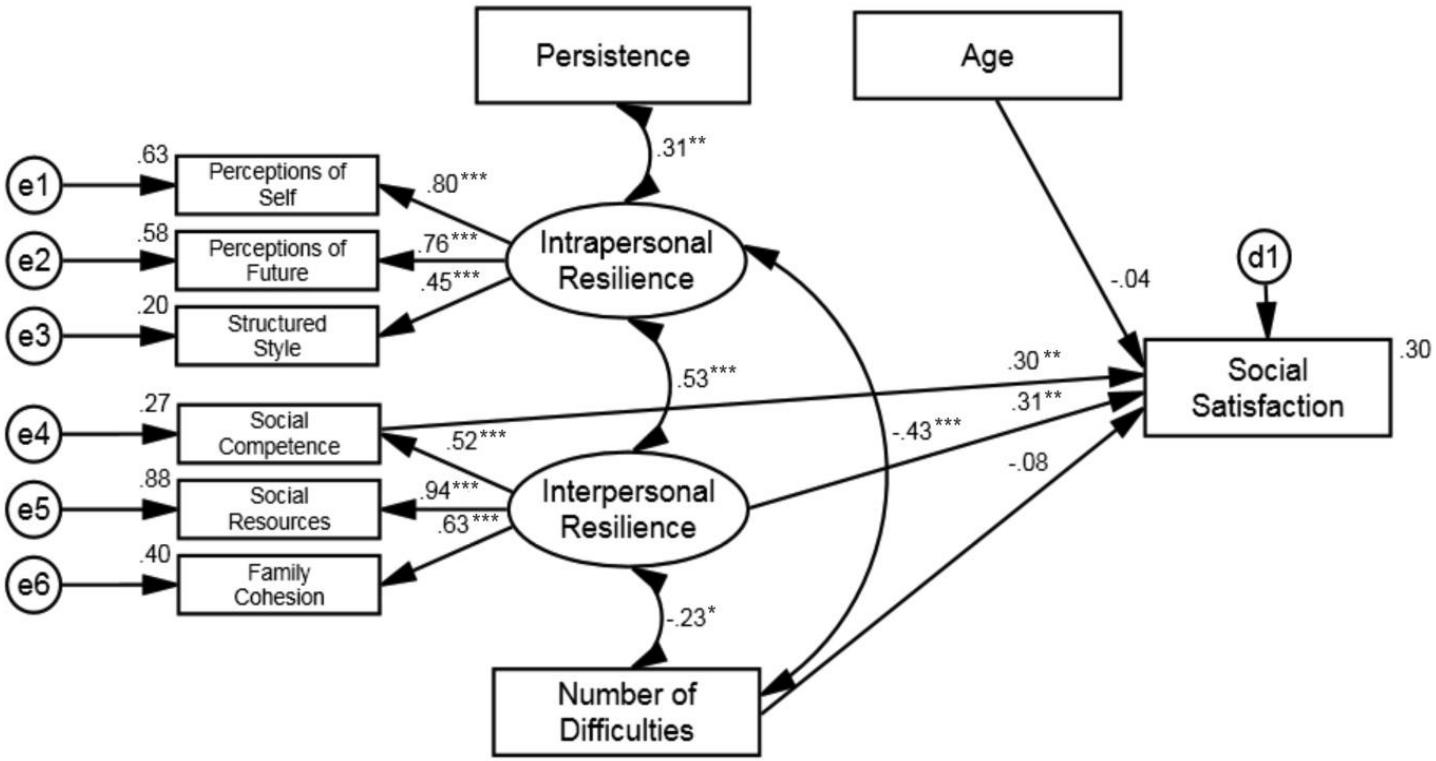

Figure 2-3. Persistence and Resilience Factors on Social Satisfaction, Controlling for Number of Difficulties and Age.
Note. Path coefficients are standardized and significant at ***p < .001, **p < .01, *p < .05.
Ovals represent latent variables; rectangles represent observed variables.

CHAPTER III. SOCIAL SUPPORT, COMMUNITY SUPPORT, AND NUMBER OF DIFFICULTIES EXPLAINING LIFE SATISFACTION AND ACADEMIC ACHIEVEMENT OF UNIVERSITY STUDENTS WITH READING DIFFICULTIES

Attending postsecondary institutions and transitioning from school to work requires adults to manage intellectual and relational demands while balancing responsibilities (Hall, 2010). Study and work demands, financial pressures, and less social time are common (Bitsika, Sharpley, & Rubenstein, 2010; Vaez & LaFlamme, 2008). Adults with reading difficulties (RD) experience additional demands including coping with increased academic stress (Undheim & Sund, 2008), negotiating accommodations (Rochette & Loiselle, 2012), and managing challenges associated with RD (Nalavany, Carawan, & Rennick, 2011). As adults with RD cope differently with these demands—some experience low academic performance (Vaez & LaFlamme, 2008) and increased risk for mental health difficulties (Undheim, 2003), while others succeed in their studies and careers (Greenbaum, Graham, & Scales, 1995; Rogan & Hartman, 1990)—understanding factors that explain well-being and academic outcomes is paramount. Support from others may be particularly important for adults with RD due to the additional demands they face that often require nonstandard solutions. In this paper, we examine three different models of social support, community support, and number of difficulties in addition to RD on life satisfaction and academic achievement of adults with RD.

Perceived Social Support, Life Satisfaction, and Academic Achievement

Perceived social support is "the extent to which an individual believes that his or her needs for support, information, and feedback are fulfilled" (Procidano & Heller, 1983, p. 2). Existing evidence suggests that a high level of perceived social support is linked to life satisfaction for adults without RD (i.e., Chow, 2005; Herrero, Fuente, & Gracia, 2011; Matheny et al., 2002; Sheldon & Hoon, 2007; Yalçin, 2011). Life satisfaction, the cognitive appraisal of one's life based on judgment criteria established by the person (Diener, 2009), is further associated with coping resources (Matheny et al., 2002) and goal engagement (San Martín, Perles, & Canto, 2010).

To our knowledge, the only study to examine social support and life satisfaction with adults with RD was conducted by Hellendoorn and Ruijssenaars (2000) who interviewed 27 Dutch adults (ages 20–39) with dyslexia about coping with life and disability. They rated participants' qualitative responses (e.g., parental support, life satisfaction) using 3-point scales (positive, hesitant or ambivalent, or negative). Those who received extensive parental support were "more likely to accept their dyslexia, felt less disabled, and reported fewer problems and more positive coping" (Hellendoorn & Ruijssenaars, 2000, p. 236) than those with less support. Further, a good relationship with parents predicted life satisfaction.

There is also evidence that social support is positively related to grade point average (e.g., DeBerard, Spielmans, & Julka, 2004; Robbins, Lauver, Le, Davis, & Langley, 2004), and appears important for academic adjustment (Credé

& Niehorster, 2011) and remaining in school (Nicpon et al., 2006) for university students in general. Social support is also important for the success of adults with RD, including employment, education, and independence (Raskind, Goldberg, Higgins, & Herman, 1999); self-esteem (Nalavany et al., 2011); and adjustment and well-being (Hellendoorn & Ruijssenaars, 2000). In Hellendoorn and Ruijssenaars's (2000) study, those who received extensive parental support achieved a higher level of education than those with less support. Parents have been reported to provide schoolwork assistance (Stampoltzis & Polychronopoulou, 2009) and friends can make school experiences more enjoyable (Ingesson, 2007; Undheim, 2003).

Perceived Community Support, Life Satisfaction, and Academic Achievement

Perceived community support includes feelings of community belongingness, community involvement, and perceptions of resource availability in community organizations (Herrero & Gracia, 2007). Feeling part of larger relational networks suggests communities can be a resource for meeting physiological or psychological needs (Nowell & Boyd, 2010) and involvement in communities provides a context in which to form support networks resulting in increased physical and psychological health, self-confidence, self-esteem, and personal empowerment (Attree et al., 2011). Students with learning disabilities, including RD, report higher levels of support from campus organizations than those without difficulties (Cosden & McNamara, 1997), and those with dyslexia credit support workers for helping them progress through university and broaden

educational aspirations (Madriaga, 2007). Community-related resources, such as academic-related centres, health and counselling services, and community organizations, also support adults with RD in meeting goals (Stack-Cutler, Parrila, Jokisaari, & Nurmi, in press).

Based on the abundance of resources community ties can provide (see Stack-Cutler et al., in press), community support has potential to contribute to life satisfaction and academic achievement. Indeed, perceptions of support from faculty (Yalçin, 2011), feelings of community belongingness (Herrero et al., 2011), and community participation (O'Connor & Jose, 2012) have been associated with higher well-being, and community involvement in the form of service has been linked to academic achievement (e.g., Schmidt, Shumow, & Kackar, 2007). Community support also corresponds with individual wellness, with higher perceived community support linked to lower rates of depression, lower perceived stress, and higher self-esteem (Herrero & Gracia, 2007). While we were unable to locate community support studies with participants with RD, these findings suggest community support can be a contributor to success for adults with RD as well.

Number of Difficulties in Addition to RD

Because reading disability seldom appears in isolation, people with RD are at higher risk for additional learning impairments (Goldston et al., 2007). Reading disability and ADHD, for example, co-occur in 25–40% of those with either disorder (Willcutt & Pennington, 2000a). People with comorbid problems also tend to have more secondary problems including academic difficulties

(Willcutt et al., 2007) and low perceived social support (Martínez, 2006) than those with a single problem (Raskind et al., 1999; Willcutt & Pennington, 2000b; in contrast, see Nelson & Gregg, 2012).

These findings suggest that students with multiple disabilities may be at increased risk for negative outcomes as young adults (Willcutt et al., 2007). Martínez and Semrud-Clikeman (2004) argued that people with multiple disabilities must exert greater effort to compensate for their learning deficits compared to those with a single or no learning disability because of the difficulties they experience in multiple areas. Further, persisting problems of learning disabilities can be exacerbated as adults with RD must deal with the added complexity of tasks and demands of adulthood (Collinson & Penketh, 2010; Gerber et al., 1990; Ingesson, 2007). Consequently, a greater number of difficulties likely creates a need for more supports. Although difficulties reported in addition to RD have been noted (e.g., Gerber et al., 1990; Hellendoorn & Ruijssenaars, 2000), little is known whether the number of difficulties reported relates to perceptions of social and community support and impacts life satisfaction and academic achievement. Thus studying the relationship between these variables may provide insight into supports and services best suited to the needs of adults with RD.

Current Study

In this study, we test three different models derived from the stress and wellness literature (e.g., Cohen & Wills, 1985; El-Bassel, Guterman, Bargal, & Su, 1998; Firth, Mellor, Moore, & Loquet, 2004) to understand the impact of

number of difficulties, social support, and community support on life satisfaction and academic achievement of adults with RD. The main effect model posits that social resources are beneficial regardless of whether a person is under stress (Cohen & Wills, 1985; El-Bassel et al., 1998). Social support has been linked to life satisfaction and academic achievement for adults in general (Chow, 2005; DeBerard et al., 2004), family support has been linked to life satisfaction for adults with RD (Hellendoorn & Ruijssenaars, 2000), and community support shows potential in contributing to life satisfaction and academic achievement (O'Connor & Jose, 2012; Schmidt et al., 2007; Yalçin, 2011). Accordingly, we expect that social support and community support will explain life satisfaction and academic achievement, controlling for number of difficulties and age.

The buffering effect model suggests differential effects of support depending on the level of stressors (Cohen & Wills, 1985; Wheaton, 1985). This model has received less validation in the literature than the main effect model (El-Bassel et al., 1998; McMahon, Felix, & Nagarajan, 2011). Given that problems of learning difficulties can be exacerbated in adulthood (Collinson & Penketh, 2010; Gerber et al., 1990), adults with a difficulty in addition to RD tend to experience negative outcomes (Martínez, 2006; Willcutt et al., 2007), and external supports have been linked to well-being (Hellendoorn & Ruijssenaars, 2000), we hypothesize that the number of difficulties adults with RD report will interact with social and community support in explaining life satisfaction and academic achievement. Specifically, we expect that the greater the number of difficulties, the greater the positive impact of social and community support.

Finally, we used a mediation model to examine the relationship between number of difficulties and life satisfaction or academic achievement. Mediation has been defined as the function "which represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest" (Baron & Kenny, 1986, p. 1173). We propose that social support and community support will mediate the relationship between number of difficulties and life satisfaction or academic achievement. Put simply, number of difficulties hinders one's ability to garner support, which in turn impacts life satisfaction and academic achievement. Previous research (i.e., Firth et al., 2004; Quittner, 1992) has lent support to a mediation model of social support.

Method

Participants

Participants were 120 adults (71% women) with self-reported RD who were completing a university degree or recent graduates at the time of data collection. Mean age was 25.7 years (*SD* = 8.5). All participants reported English as their first language. Most participants' parents (60% mothers, 68% fathers) had completed postsecondary education (i.e., trade or business school, college, university degree). Participants reported reading difficulties present among family members: 42.1% had a parent, 28.3% had a sibling, and 22.3% had an extended family member with RD; 62% named at least one of the three.

Measures

History of reading difficulty. The Adult Reading History Questionnaire-Revised (Parrila, Corkett, Kirby, & Hein, 2003; see also Deacon, Cook, & Parrila,

2012, and Parrila, Georgiou, & Corkett, 2007) was used to determine self-reported RD. Participants completed demographic information (10 items), Elementary School Difficulties scale (8 items; α = .88), and Current Difficulties scale (12 items; α = .79). Elementary RD items ask about reading difficulties participants may have experienced as children (e.g., help received when learning to read, attitude toward reading), and current RD items include similar questions to the elementary school section with additional questions about reading for courses and time spent reading textbook chapters. Participants rated items using a 5-point Likert scale (0 to 4); higher scores indicate more difficulty with reading skills. Responses were totalled and divided by the maximum possible score for each scale, yielding a score for each participant (see Lefly & Pennington, 2000). Thus, the lowest possible score was 0 and the highest 1. We used a score of 0.45 or greater on the elementary or current difficulties section to indicate self-reported RD (see Deacon et al., 2012; Parrila et al., 2007): 59.2% (n = 71) scored 0.45 or above on both elementary and current reading difficulties, 14.2% (n = 17) on elementary difficulties only, and 26.7% (n = 32) on current difficulties only. Means in this study were 0.59 (SD = 0.22, range = 0.06–1.00) for elementary school RD and 0.59 (SD = 0.14, range = 0.23–0.96) for current RD. The scales were moderately correlated, r = .24, p = .009.

Social support. The 12-item Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) assessed support from family (4 items; e.g., “My family is willing to help me make decisions”), friends (4 items; e.g., “I can talk about my problems with my friends”), and significant others (4

items; “There is a special person in my life who cares about my feelings”). Participants rated items using a 7-point scale from *very strongly disagree* (1) to *very strongly agree* (7), with higher scores indicating higher perceptions of support. Both the composite score (α = .90) and individual scale reliabilities (family support, α = .88; friend support, α = .92; and significant other support, α = .96) were high.

Community support. The 14-item Perceived Community Support Questionnaire (Herrero & Gracia, 2007) measures three domains of community support (5-point scale, 1 = *strongly disagree* to 5 = *strongly agree*): community integration (4 items; e.g., “I identify with my community”), community participation (5 items; e.g., “I take part in some social or civic groups in my community”), and community organizations (5 items; e.g., “I could find people that would help me feel better”). Higher scores indicate higher perceptions of support. Two items were reverse coded. Both the composite score (α = .90) and individual scale reliabilities (community integration, α = .76; community participation, α = .87; and community organizations, α = .84) were satisfactory.

Life satisfaction. The Extended Satisfaction with Life Scale (Alfonso, Allison, Rader, & Gorman, 1996) assesses nine life satisfaction domains. We selected three satisfaction domains relevant to adults attending postsecondary institutions or recent graduates: general (e.g., “I am satisfied with my life”), self (e.g., “I am generally pleased with myself as an individual”), and social (e.g., “In most ways my social life is close to my ideal”). Each domain has 5 items. Participants indicated level of agreement using a 7-point scale (1 = *strongly*

disagree, 7 = *strongly agree*); higher scores indicate greater satisfaction. Cronbach's alphas were .93 (general satisfaction), .92 (self satisfaction), and .96 (social satisfaction).

Academic achievement. Students reported an overall grade point average (GPA) as well as grades from the three most recent courses completed. We computed grades into an average grade. Because participants attended universities across Canada, if GPA and grades were reported using a scale other than a percent, they were converted to a percent using the guidelines from individual universities' websites. Not all participants indicated a GPA but did list their last three grades. Because GPA and the average of the last three grades correlated positively, $r = .69$ ($p < .001$), for these cases ($n = 14$), average of last three grades was used in place of GPA. Of those with academic achievement data ($n = 111$), over one-third ($n = 44$, 39.6%) reported an average of 70–79%, nearly one-third ($n = 33$, 29.7%) an average of 80–89%, and more than a quarter ($n = 29$, 26.1%) an average of 60–69%. Only a few participants reported an average of 50–59% ($n = 4$, 3.6%) or 90% or higher ($n = 1$, 0.9%).

Number of difficulties. To examine the number of difficulties reported in addition to RD, we provided participants a prompt: "In addition to experiencing difficulties with reading and/or spelling, please circle any other difficulties you may experience." Participants selected from a list of 12 difficulties (Gerber et al., 1990) and could fill in difficulties not mentioned in two spaces provided. Most participants (92%) reported having at least one difficulty in addition to RD, with 58% noting 2–4 difficulties: distractibility (48%), writing (47%), memory (41%),

mathematics (41%), attention (35%), speaking (31%), fine motor skills (24%), listening (23%), auditory (20%), impulsivity (13%), coordination (10%), and hyperactivity (7%). In the "other" category, 20.8% of participants listed one difficulty (e.g., anxiety, depression, chronic pain, planning) and 5.8% listed two.

Procedure

Most participants (64.5%) completed surveys in-person at a large Western Canadian university, while the remaining 35.5% completed surveys online. Our web-based survey was a simple translation from the paper-and-pencil counterpart, and data from such surveys are largely equivalent to paper-and-pencil data (Cole, Bedeian, & Feild, 2006). We conducted bivariate analyses using Bonferroni adjustment ($p < .0028$) to see if there were significant differences between in-person and online samples. In-person participants ($M = 23.4$, $SD = 5.7$) were younger than those online ($M = 30.0$, $SD = 11.1$), $t(119) = 4.37$, $p < .001$, and reported fewer difficulties in addition to RD than online participants (2.9 and 5.1, respectively), $t(119) = 5.02$, $p < .001$. Data were analysed as one group for the remainder of the study, controlling for age and number of difficulties.

Statistical Analyses

Descriptive analyses were performed using SPSS 20 for Windows. We examined the strength and direction of relationships between variables using Pearson correlations. To understand these relationships further, we conducted structural equation modeling (SEM) using AMOS 20 to examine main effect, buffering effect, and mediation models. To examine the buffering effect model, we developed two moderator variables. We first centred social support,

community support, and number of difficulties. We then created two variables: social support by number of difficulties, and community support by number of difficulties. Social support, community support, number of difficulties, age, and moderator variables (social support by number of difficulties, and community support by number of difficulties) were modeled as observed variables. Moderator variables were not significantly correlated with any centred variables, confirming that collinearity was not an issue following centring. We modeled academic achievement as an observed variable and life satisfaction as a latent factor with three observed variables (general, self, and social).

To conduct SEM, a minimum sample size of 100 is recommended and the participants-to-parameter ratio should be no less than 5:1 (Kline, 2011). Our sample size met these criteria. We used Maximum Likelihood estimation, which provides unbiased, reliable, and efficient parameter estimates (Nevitt & Hancock, 2001) and a test statistic for evaluating fit. Although non-normality has little impact on model parameter estimates when using Maximum Likelihood estimation, problems may arise when estimating parameter standard errors and test statistics (Bentler & Yuan, 1999). Bootstrap resampling, in which an empirical sampling distribution is established by randomly drawing multiple subsamples with replacement from the parent sample (Nevitt & Hancock, 2001), is an approach to managing non-normality. When conducting parameter estimation, we used the standard bootstrapping technique to assess fit of parameter estimates using 500 samples (see Bollen & Stine, 1992), which yielded meaningful solutions in all 500 instances. In addition, we used multiple fit indices

when evaluating our models, including the traditional chi square and Bollen-Stine chi square ($p > .05$), χ^2/df (< 3 is acceptable), standardized root mean square residual (SRMR), and Comparative Fit Index (CFI). Hu and Bentler (1999) suggested that values close to 0.95 for the CFI and close to 0.08 for the SRMR result in lower Type II error rate.

Prior to analyses, we examined data for outliers, missing values, and normality. Two outliers (z-score > +/-3.29) on the Multidimensional Scale of Perceived Social Support were winsorized (Duan, 1999). Using Mahalanobis distance, we removed one multivariate outlier. Missing values were few (three in total) and random, so we used Ipsative mean substitution (Schafer & Graham, 2002). The Multidimensional Scale of Perceived Social Support and the Extended Satisfaction with Life Scale deviated slightly from normality.

Results

Descriptive Statistics and Correlations

Table 1 presents descriptive statistics and correlations. Life satisfaction scales (general, self, and social) correlated positively, and higher levels of social support corresponded with higher levels of community support and life satisfaction. Community support correlated positively only to social satisfaction. Number of difficulties was negatively associated with general satisfaction and social support, indicating that those reporting a greater number of difficulties had lower perceptions of general satisfaction and social support. Age did not correlate with any study variable. Contrary to expectations, academic achievement did not

correlate with any other variable. Thus, we did not include academic achievement in further analyses.

One methodological requirement for testing a buffering effect model is that a significant relationship exists between number of difficulties and life satisfaction (Cohen & Wills, 1985). As noted above, this requirement was met. Four steps are required to establish mediation (Baron & Kenny, 1986). First, a significant relationship must exist between number of difficulties (predictor) and life satisfaction (outcome). Second, number of difficulties must correlate significantly with social support and community support (mediators). Third, social support and community support must correlate significantly with life satisfaction. Finally, the effect of number of difficulties on life satisfaction controlling for social support and community support should be zero for full mediation or lowered for partial mediation. Because number of difficulties and community support did not correlate significantly, only social support was used as a mediator in the mediation model tested.

Testing Support Models

The hypothesized main effect model of social support and community support explaining life satisfaction fit the data well: χ^2 (13) = 23.51, p = .036; χ^2/df = 1.81; Bollen-Stine p = .092; SRMR = .07; CFI = .93. Modification indices also suggested good model fit. The model explained 34% of the variance in life satisfaction. The full model with standardized parameter estimates is presented in Figure 1. It shows that (a) social support and community support were related, (b)

social support explained life satisfaction, and (c) community support did not explain life satisfaction, controlling for number of difficulties and age.

The proposed buffering effect model also fit the data well: $\chi^2(26) = 34.96$, $p = .113$; $\chi^2/df = 1.34$; Bollen-Stine $p = .569$; SRMR = .07; CFI = .94, and explained 34% of the variance in life satisfaction. However, the proposed buffering effects in the model were not supported. Figure 2 shows that (a) social support did not significantly moderate number of difficulties and life satisfaction and (b) community support did not significantly moderate number of difficulties and life satisfaction.

The mediation model fit the data well: $\chi^2 (8) = 17.96$, $p = .022$; $\chi^2/df = 2.25$; Bollen-Stine bootstrap $p = .042$; SRMR = .06; CFI = .93. Examination of modification indices also suggested good model fit and the model explained 37% of the variance in life satisfaction. The full model with standardized parameter estimates is presented in Figure 3. It shows that (a) number of difficulties (predictor) explained life satisfaction (outcome), (b) number of difficulties related significantly to social support (mediator), and (c) a significant relationship existed between social support and life satisfaction. When we tested the relationship between number of difficulties and life satisfaction in the presence of social support, the strength of this relationship was reduced from $\beta = -.35$, $p < .001$ to $\beta = -.23$, $p = .006$, suggesting partial mediation.

Following the guidelines in Ievers-Landis, Burant, and Hazen (2011), we examined next the stability of the bootstrapping models. We compared the original sample weights (unstandardized and standardized) with the mean weights

of the bootstrap samples to ensure these did not dramatically differ. The path differences (bias) were small (-0.007 to 0.053; C. Burant, personal communication, June 21, 2013). We then compared the standard error (SE) of the mean bootstrap from all 500 samples with the SE-Bias between the original model and bootstrap samples. In each case, the SE-Bias was less than the SE indicating that the paths/covariances/correlations were stable and unbiased.

Finally, we modeled the individual perceived social support scales from the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988)—family, friends, and significant others—as uncorrelated observed variables to explain life satisfaction (model not shown). Results indicated that standardized path coefficients between family support and life satisfaction ($\beta = .22$, $p = .024$), friend support and life satisfaction ($\beta = .32$, $p = .001$), and significant other support and life satisfaction ($\beta = .26$, $p = .008$) were all significant, suggesting that each form of social support contributed to life satisfaction.

Discussion

The purpose of our study was to examine three different models to understand the impact of number of difficulties, social support, and community support on life satisfaction and academic achievement with adults with RD. As expected, social support contributed significantly to life satisfaction, a result consistent with previous research showing that adults without RD with higher perceived social support experience higher life satisfaction (e.g., Herrero et al., 2011; Matheny et al., 2002; Sheldon & Hoon, 2007). Our research adds to the

literature in that we found support from family, friends, and significant others all positively impact life satisfaction for adults with RD.

Contrary to our expectations, perceived social support was not related to academic achievement. Previous research examining this relationship has yielded mixed findings. Some have found a link between social support and academic success (e.g., DeBerard et al., 2004; Hellendoorn & Ruijssenaars, 2000; Raskind et al., 1999; Robbins et al., 2004; Tynkkynen, Nurmi, & Salmela-Aro, 2010). For example, in their meta-analysis of 33 studies, Robbins et al. (2004) found a cross-sectional relationship between perceived social support and GPA in post-secondary education across studies, although the effect size was relatively small (r = .11). Others (e.g., MacKinnon, 2012; Nicpon et al., 2006) have not found evidence of such a relationship. In our study, we considered the support of close relationships in relation to academic achievement. Perhaps institutional supports, such as professors, disability service professionals, or tutors, would have a greater impact on academic achievement. Further, the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988) items asked participants about support available to help make decisions or discuss problems, for emotional support, or for general help. While these forms of support are important to life satisfaction, we did not inquire about available supports for academic issues, which may translate more directly to academic outcomes.

Further, when comparing our study to previous research, sample characteristics and methods used to measure academic achievement differ. Many studies have included adolescent or postsecondary students without a known

reading difficulty (DeBerard et al., 2004; Robbins et al., 2004; Tynkkynen et al., 2010). The two studies that included adults with RD (i.e., Hellendoorn & Ruijssenaars, 2000; Raskind et al., 1999), however, measured academic success as the highest level of education obtained, rather than using GPA as in the current study. It is possible that social support may help adults with RD complete higher education credentials, but may have less of an impact on the actual grades obtained. Future studies should attempt to understand the role different people play, long-term, in supporting adults with RD.

The perception that social support is available when needed is important for extending support in domains outside family and friend relationships (Gracia & Herrero, 2004). In the current study, social support and community support correlated positively, suggesting that adults with RD involved in their community are able to gain social support from these activities, establishing close relationships through activity engagement. Alternatively, adults with RD who feel supported in their close relationships also seek support and resources from their community. This finding reflects O'Connor and Jose (2012) who found participation in community activities was related to greater social support, but is in contrast to Herrero and Gracia (2004) who failed to find a link between perceived social support and social integration (i.e., community participation and perceptions of resource availability in the community). Further research is warranted, including longitudinal studies designed to understand the direction of this relationship.

Perceived support from faculty (Yalçin, 2011), feelings of belonging to a community (Herrero et al., 2011), and community participation (O'Connor & Jose, 2012) have been linked to higher life satisfaction. In the present study, perceived community support did not predict life satisfaction. Although the impact of community support on life satisfaction did not reach significance in the full model, there were small positive correlations between the community support and life satisfaction scales. A model including only community support and life satisfaction showed a significant path estimate ($\beta = .25$, $p < .05$) from community support to life satisfaction. The effect was suppressed, however, when social support was entered into the model, suggesting that social and community support explained partly the same variance in life satisfaction, with social support being the stronger predictor. Perceived community support also did not correlate with academic achievement. Further research is needed to examine the influence of community support for adults with RD.

Similar to previous research (i.e., El-Bassel et al., 1998; McMahon et al., 2011), the buffering effect model was not supported in our study. Cohen and Wills (1985) reasoned that measures that elicit general availability of support, without assessing specific resources, are likely to result in a main effect without buffering interactions. In addition, Cohen and Wills argued that the buffering effect model is most effective when the type of support matches the challenges that accompany the stressor. It is possible that the items measuring perceived social and community support in our study did not match well with the needs associated with having a greater number of difficulties in addition to RD.

The number of difficulties reported in addition to RD negatively corresponded with social support and life satisfaction, similar to previous research in which students with multiple learning disabilities had low perceived social support compared to those with only one learning disability or those without (Martínez, 2006). In other words, the greater the number of difficulties, the lower the perceived social support and life satisfaction. Through the mediation model, we found that social support partially mediated the relationship between number of difficulties and life satisfaction and that reduced social support may be one mechanism by which number of difficulties is linked with life satisfaction. In a previous study, Quittner (1992) found that social support mediated the relationship between stress and adjustment.

Our results need to be considered in light of several limitations. Because our sample included adults with self-reported RD completing a university degree or recent graduates, its representativeness is likely limited to adults with RD in postsecondary education settings. Also, because Canadian universities have offices dedicated to providing supports to students with disabilities, our results are likely applicable only to settings were student services are available at least to some degree. When no such services are offered, we would expect social and possibly community support to be more important. Further, we did not define "community" for participants, but allowed it to carry the meaning that participants attached to it. Thus adults with RD may not have felt a part of their neighbourhood community, for example, but may have been involved in and received support from their residence, academic department, or religious

affiliations. Future research on community support with adults with RD should consider providing a definition with examples of potential communities in which participants may be involved or encourage participants to provide a qualitative description of their community to provide a context to situate the findings. Finally, although we examined the number of difficulties in addition to RD, we did not measure severity of difficulties. Future research may wish to examine the impact of severity of difficulties on well-being and academic outcomes.

Our results demonstrate that higher perceived social support contributes to higher life satisfaction and a greater number of self-reported difficulties contributes to lower life satisfaction and links to lower perceived social support for adults with RD in higher education. These findings are of importance to those working with this population. Adults with RD are likely to require holistic supports that address their social and emotional needs in addition to academic skills. These supports may include having people in their lives, including relationships with family, friends, and significant others, as well as developing university and community connections to help make decisions or discuss problems, provide emotional support, or for general assistance. It is evident in other research (e.g., Stack-Cutler et al., in press) that such supports are available both within and outside postsecondary institutions; however, awareness and use of such services by adults with RD is only beginning to be understood.

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Table 3-1
Means, Standard Deviations, and Correlations Among Variables

	1	2	3	4	5	6	7	8
1 Social support	1.00							
2 Community support	.30**	1.00						
3 Number of difficulties	-.18*	-.01	1.00					
4 Age	-.08	-.09	.10	1.00				
5 General satisfaction	.47***	.17	-.36***	-.08	1.00			
6 Self satisfaction	.42***	.17	-.12	-.05	.68***	1.00		
7 Social satisfaction	.43***	.21*	-.18	-.09	.41***	.42***	1.00	
8 Academic achievement[a]	-.01	.04	-.10	-.03	-.01	-.02	.04	1.00
M	66.31	46.79	3.68	25.67	5.07	4.94	4.59	73.89
SD	11.75	10.11	2.55	8.54	1.40	1.23	1.54	8.14

[a] $n = 111$.
* $p < .05$, ** $p < .01$ *** $p < .001$

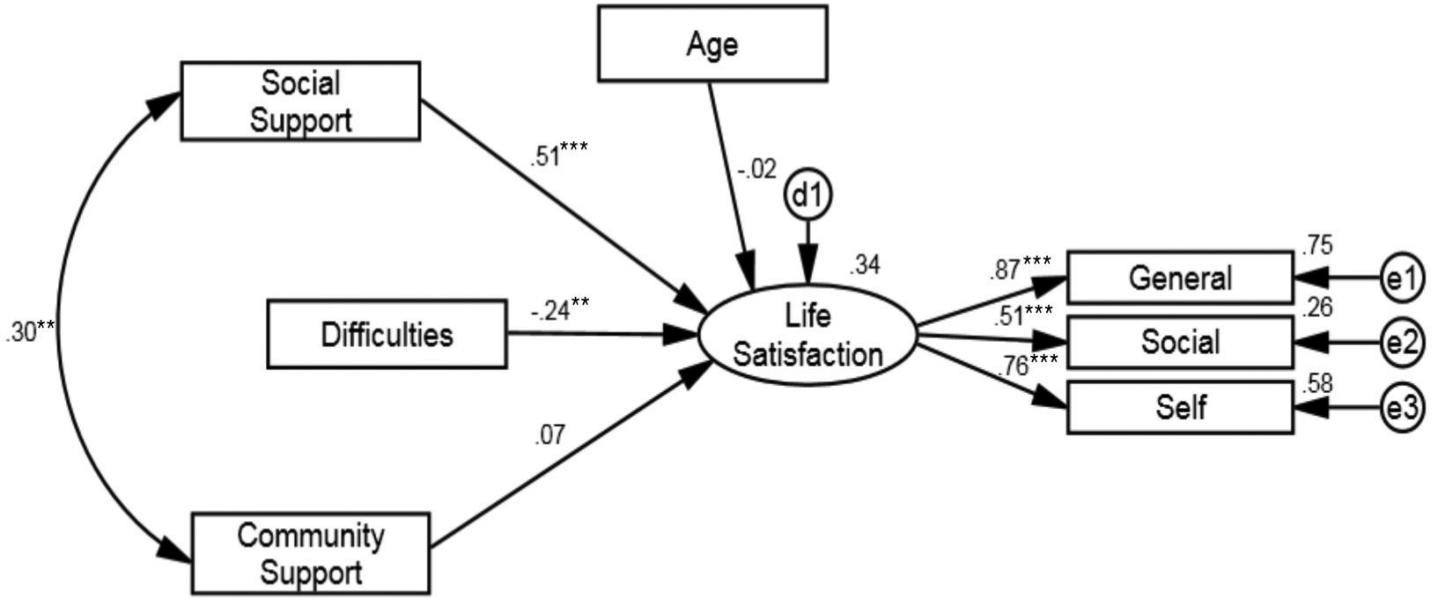

Figure 3-1. Main Effect Model of Social Support and Community Support on Life Satisfaction. Path coefficients are standardized and are significant at ***p < .001, **p < .01.

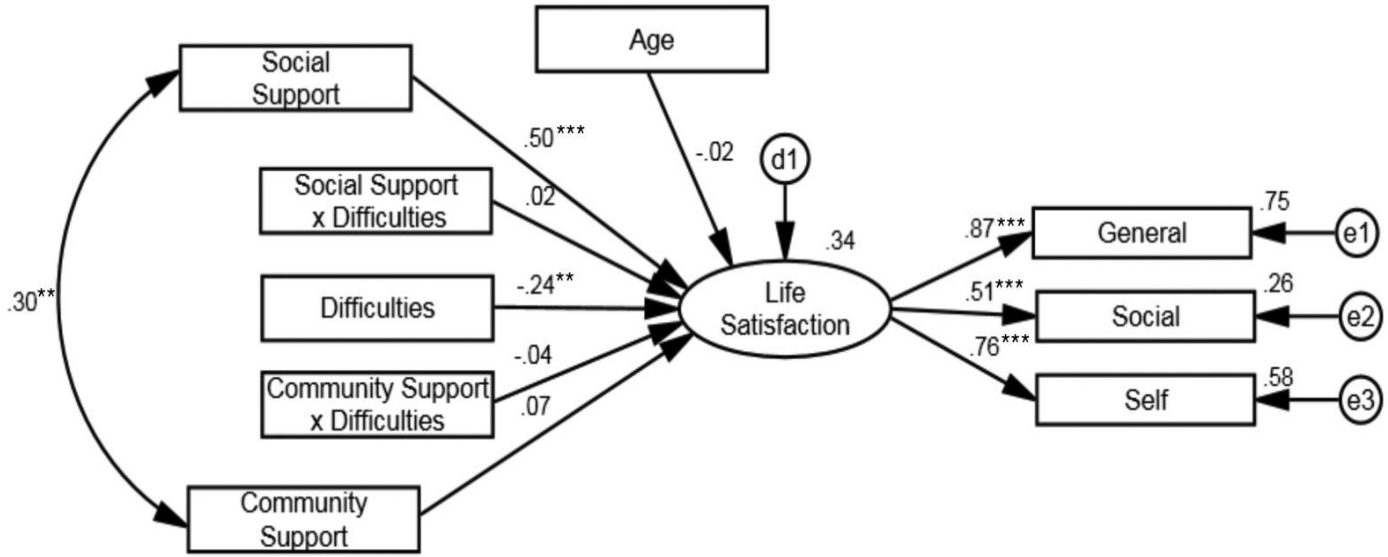

Figure 3-2. Buffering Effect Model of Social Support and Community Support as Moderators of Number of Difficulties and Life Satisfaction.
Path coefficients are standardized and are significant at ***p < .001, **p < .01.

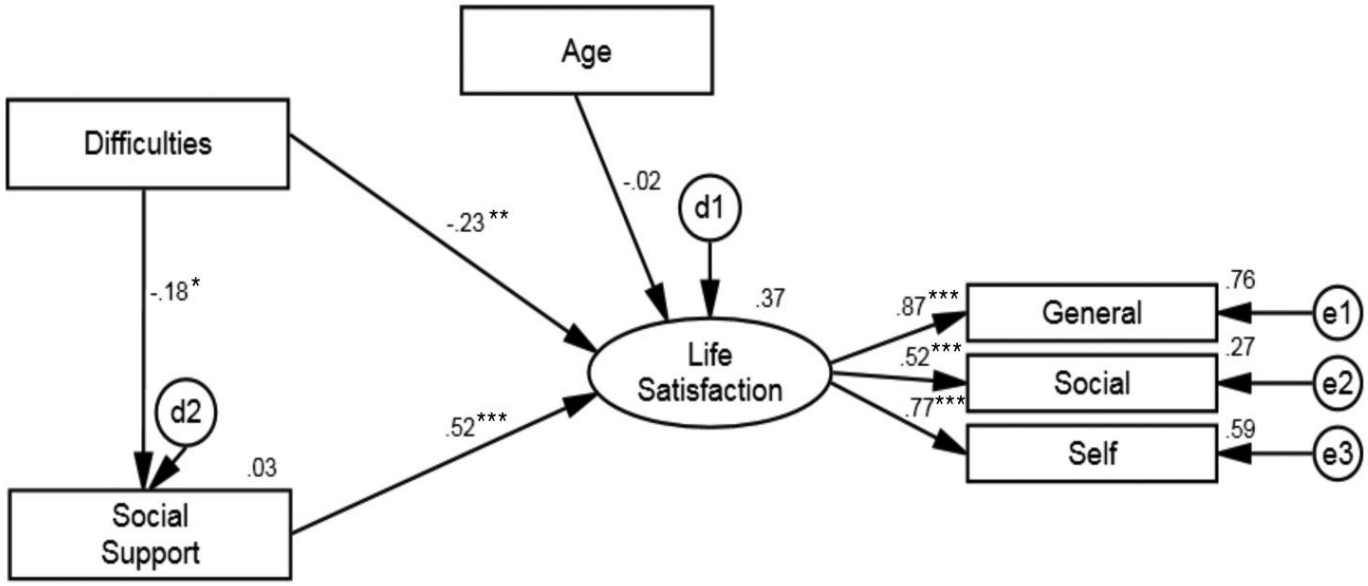

Figure 3-3. Mediation Model of Social Support as a Mediator of Number of Difficulties and Life Satisfaction. Path coefficients are standardized and are significant at ***p < .001, **p < .01, *p < .05.

CHAPTER IV. HOW UNIVERSITY STUDENTS WITH READING DIFFICULTIES ARE SUPPORTED IN ACHIEVING THEIR GOALS[1]

Individuals with a reading difficulty (RD) continue to experience academic challenges as they reach adulthood and enter postsecondary education (e.g., Collinson & Penketh, 2010; Gerber et al., 1990; Ingesson, 2007). Despite continued challenges, adults with RD can attain success in their studies and achieve career goals (e.g., Rogan & Hartman, 1990; Seo, Abbott, & Hawkins, 2008). Adults with RD frequently see achieving one's goals as a shared process (e.g., Corkett, Hein, & Parrila, 2008; Goldberg, Higgins, Raskind, & Herman, 2003) and goal-related social ties have been shown to positively impact educational and employment success of adults without RD (e.g., Jokisaari & Nurmi, 2005; Tynkkynen, Nurmi, & Salmela-Aro, 2010). In this study, we bring these two lines of research together to examine (a) the social ties that university students with RD report supporting them in achieving goals, (b) the outlets available for developing social ties, (c) the resources mobilized within these relationships, and (d) the impact of social ties' status on academic achievement.

Social Capital as Network-based Resources

The importance of social ties can be understood in relation to social capital. *Social capital* refers to the combination of actual or potential resources linked to having a network of social ties (Briggs, 1998; Lin, 1999). Resources among one's social ties can help enhance personal outcomes, including goal

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achievement, by providing information and opportunities not otherwise available (Coleman, 1988; Lin, 1999). By drawing on others in decision-making and goal-setting pursuits, people can expand their options, receive information and perspective, and be reassured of their planned choices (Phillips, Christopher-Sisk, & Gravino, 2001).

Social capital can be conceptualized to consist of two types of ties: personal and institutional. Personal social capital involves support and resources found in close relationships (e.g., friends, family), and is characterized by strong ties among members but with less new information being brought into the network for use compared with institutional social capital (Lee & Brinton, 1996; Stanton-Salazar, 2011). Institutional social capital involves support and resources offered by ties in institutional settings (Lee & Brinton, 1996; Stanton-Salazar, 2011). It is characterized by weak ties (Granovetter, 1973), bringing together people with diverse educational and social backgrounds and thus more new information than personal social capital. In the current paper, we use the term *personal social ties* to describe ties within personal social capital and *institutional social ties* to describe ties within institutional social capital.

According to Lin's social resource theory, *accessed social capital* refers to the availability of resources within one's social network (Lin, 1999). The few studies that have investigated the experiences of adults with learning disabilities, including RD, during postsecondary education agree that social capital has potential to contribute to positive outcomes (e.g., Raskind, Goldberg, Higgins, & Herman, 1999). The most notable social ties identified as positive factors are

personal: parents (e.g., Greenbaum, Graham, & Scales, 1995; Hellendoorn & Ruijssenaars, 2000; Morningstar, Turnbull, & Turnbull, 1995), other family members (e.g., Corkett et al., 2008; Spekman, Goldberg, & Herman, 1992), and friends (e.g., Goldberg et al., 2003; Greenbaum et al., 1995). Social ties that create institutional social capital are generally mentioned less often, but include teachers (Morningstar et al., 1995; Spekman et al., 1992), professors (Greenbaum et al., 1995), classmates (Corkett et al., 2008), tutors (Spekman et al., 1992), librarians (Corkett et al., 2008), therapists (Spekman et al., 1992), co-workers (Goldberg et al., 2003), employers (Spekman et al., 1992), and service providers (Morningstar et al., 1995).

In contrast, *mobilized social capital* is defined as "the use of social contact and the resources provided by the contact" (Lin, 1999, p. 471). Having social ties does not increase social capital if accessible resources are not shared with those who need them (Stanton-Salazar & Dornbusch, 1995). Research examining what resources are mobilized through personal and institutional ties is sparse. In one study, Van Der Gaag and Snijders (2005) developed a Resource Generator that asked participants about access to a fixed list of resources (e.g., know someone who owns a car, has personal computer skills). However, the resources listed could vary depending on characteristics and needs of the population surveyed and resource mobilization was not examined. Given the paucity of research, we opted for an open-ended approach to allow university students with RD to inform us of the resources they mobilize to achieve goals.

As adults with RD pursue postsecondary education and, further, transition from postsecondary settings into employment, they need to develop new social ties to obtain appropriate social capital. In the few existing studies on the topic, youth and adults have reported developing social ties through in-class and on-line learning (Francescato, Mebane, Porcelli, Attanasio, & Pulino, 2007), volunteering (Kay & Bradbury, 2009), and participation on sports teams (Broh, 2002). We expand on these findings by asking where university students with RD develop personal and institutional social ties.

Social Ties and Academic Achievement

There is considerable evidence linking social tie use to positive educational and vocational outcomes for adults without RD (e.g., Kuh & Hu, 2001; Martin, 2009; Stanton-Salazar & Dornbusch, 1995; Tynkkynen et al., 2010; see Dika & Singh, 2002, for a review of studies in secondary education). Of interest in the current study is the status of these ties in relation to educational outcomes, such as GPA. Social tie status may be critical because social ties in higher occupational positions have access to more advantageous resources and connections than those in lower positions (Lin, 1999). For example, in Jokisaari and Nurmi's (2005) study examining goal-related social ties of university graduates, those who had social ties with higher socioeconomic status experienced employment success more often than graduates with lower SES ties. Similarly, high-achieving African American undergraduate men's use of high status ties provided them with more and better resources than accessing support from lower status ties (Harper, 2008).

Having student social ties with higher academic performance may also positively impact academic achievement. Indeed, the academic performance of students tends to become similar to that of their peers (Kiuru et al., 2011; Nichols & White, 2001), with higher performing friends providing an upward pull to others in their group (Lomi, Snijders, Steglich, & Torló, 2011).

Interview (e.g., Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Nielsen, 2001; Spekman et al., 1992) and survey (e.g., Raskind et al., 1999; Rogan & Hartman, 1990) research with postsecondary students with learning disabilities, including RD, suggest support from various individuals contributes to educational success; however, the concept of social capital has not been applied to researching goal-related social ties of university students with RD.

Current Study

Because adults with RD who attend postsecondary education are less likely to graduate with degrees (DaDeppo, 2009; Murray, Goldstein, Nourse, & Edgar, 2000) and are more likely to experience additional demands than adults without RD (Nalavany, Carawan, & Rennick, 2011; Rochette & Loiselle, 2012), the availability of supports and services is assumed to be critical to the success of these students (Stodden, Whelley, Chang, & Harding, 2001). However, we were unable to locate studies that examine the outlets for developing social ties and what resources are mobilized in these relationships to support university students with RD. Further, few studies have examined the consequences of social capital on university students' academic achievement, and even fewer have involved university students with RD.

The purpose of this exploratory mixed-method study was to address some of these gaps by examining the goal-related social ties and resources that support university students with RD in achieving school and work goals. More specifically, we asked (1) With whom do university students with RD discuss their goals and important related matters? (2) What outlets are available for developing personal and institutional social ties? (3) What resources are mobilized within these relationships? and (4) Does social tie status explain academic achievement?

Method

Participants

As part of a larger study examining reading abilities, work habits, and supports of university students with RD, we recruited participants through student disability centre list servers at a large western Canadian university (on-campus survey) and from 11 degree-granting Canadian universities (on-line survey). Participants were 107 university students (72.9% women) with a history of RD who were completing or had recently completed a degree at the time of the study in various disciplines (e.g., arts, science, education, health). Participants ranged in age from 18 to 55 years (M = 25.21, SD = 7.21) and reported English as their first language. Participants reported having a variety of difficulties in addition to RD. Most participants (92.5%) reported having at least one difficulty in addition to RD, with 57% noting two to four: distractibility (51%), writing (46%), memory (42%), mathematics (42%), attention (35%), speaking (29%), listening (25%), fine motor skills (22%), auditory (22%), impulsivity (14%), coordination (11%),

hyperactivity (8%), and 28% reported "other" difficulties (e.g., anxiety, depression, chronic pain, planning). Most participants' parents (60.7% mothers, 67.9% fathers) had completed postsecondary education (i.e., trade or business school, college, undergraduate or graduate degree). Reading difficulties were present among family members, with participants reporting that 42.1% of their parents, 28.3% of siblings, and 21.5% of extended family members had a difficulty. The majority of participants (62.6%) reported at least one of the three.

Measures

Self-reported reading difficulties. We used the Adult Reading History Questionnaire-Revised (Parrila, Corkett, Kirby, & Hein, 2003) to determine self-reported RD. The 8-item Elementary School Difficulties scale ($\alpha = .87$) asks about reading difficulties participants experienced as children, such as amount of difficulty learning to read. Items are rated using a 5-point Likert scale (0 to 4), with higher scores indicating more difficulty with reading skills. Similar questions are asked in the 12-item Current Difficulties scale ($\alpha = .78$) with additional questions about reading for courses and time spent reading textbook chapters. Responses for each section were totalled and divided by the maximum possible score for the scale; thus, the lowest possible scale score was 0 and the highest 1. A scale score of 0.45 on either elementary or current difficulties scale was used to determine a history of RD.

Goal-related social ties and mobilized resources. In the Goal-Network Inventory (Jokisaari & Nurmi, 2000), participants were first asked to list five social ties with whom they have discussed goals and related matters: "People

often discuss their goals and related matters with others. The people with whom one has discussions may, for example, include school and organization personnel or friends and relatives. If you look back over the last 6 months, who are the people with whom you have discussed important matters related to your personal goals (e.g., study, work)?" All participants listed at least two social ties, with 89.7% listing five.

Relationship type. Next, participants described each tie's relation to personal goals. We coded these relations into seven categories: friend, parent, significant other (e.g., boy/girlfriend, spouse), sibling, school personnel or professionals, acquaintance, and extended family.

Occupation status. If a social tie was employed, participants listed his or her occupation. We coded occupations using the National Occupation Classification-Statistics system (Statistics Canada, 2006), then equated these codes to Boyd's (2008) ranking system. Boyd classified 520 occupational titles from 2001 census data of the Canadian population aged 15 and older: "numbers of persons in a given occupational category for the experienced labor force (those having an occupation in 2000 and/or 2001) are used to weight the median values for education and earnings, and the arrays are transformed into percentiles" (p. 61). We chose the social tie with the highest occupational status to indicate social capital for each participant (e.g., Lin, 1999), with lower scores indicating higher social capital.

Student ranking. If a social tie was a student, in place of providing occupational information, participants ranked student social ties: "If this person is

a student, please rank his/her success as 1 = above average student, 2 = average student, and 3 = below average student," with lower scores indicating higher student performance. We chose the social tie with the highest student performance to indicate social capital (student ranking) for each participant.

Additional resources. To understand the outlets where personal and institutional social ties can be found as well as the specific resources mobilized within these relationships, after completing the Goal-Network Inventory participants were given the prompt "Other resources may help you to achieve your goals, such as the internet (e.g., websites, chat forums, social media networking sites) or university/community organizations (e.g., Specialized Support and Disability Services, Learning Disabilities Association of Canada)." In this open-ended question, participants listed up to five social tie outlets they used for support and described the resources mobilized: 63.6% named three or more social tie outlets and resources mobilized. Overall, we coded 344 outlets, with 16.6% being personal social capital, 48.8% being institutional social capital, and 34.6% being non-relational. Only relational social tie outlets are considered.

Academic achievement. We asked participants to list their overall GPA and grades from their last three courses. Eighteen participants (16.8%) did not provide their overall GPA and one participant (0.9%) reported receiving a "pass," without indicating a numerical value. Of these, 12 indicated grades for their last three courses. GPA and Grades were highly correlated, $r = .70$ ($p < .001$), and for these 12 participants, averaged grades were used in place of GPA to represent academic achievement. GPA mean was 74.1 ($SD = 7.94$, range = 55–90).

Qualitative Data Analysis

To analyze the responses to the open-ended question about social tie outlets and resources mobilized, we followed Patton's (2002) constant comparison method. The first author read the responses several times before dividing responses based on the personal and institutional nature of the social tie outlets. Next, codes for the listed supports were generated and grouped. Once it was determined that all responses would not fit better in a different category, the resources mobilized within each of the support categories were analyzed using the same procedure. The number of resources reported within each category and the number of participants that listed each category at least once were calculated.

Results

Descriptive Statistics

Adult Reading History Questionnaire-Revised results indicated that 62.6% (n = 67) of participants scored 0.45 or above on both elementary and current reading difficulties scales, 13.1% (n = 14) scored above 0.45 on elementary difficulties only, and 24.3% (n = 26) on current difficulties only. Means in this study were 0.59 (SD = 0.22, range = 0.06–1.00) for elementary school difficulties and 0.59 (SD = 0.14, range = 0.23–0.96) for current difficulties. The scales were moderately correlated, r = .25, p = .010.

With Whom do University Students with RD Discuss Their Goals and Important Related Matters?

Results from the Goal-Network Inventory are summarized in Table 1. All participants listed a personal social tie at least once; the majority of responses

named friend, parent, and significant other. Institutional social ties were named considerably less often with 28.1% of participants listing at least one institutional social tie.

What Outlets are Available for Developing Personal and Institutional Social Ties and What Resources are Mobilized Within These Relationships?

To answer these questions, we now move to analyzing participants' responses to the open-ended questions: no quantitative analyses were done with these responses other than frequency counts.

Personal social capital outlets. Participants reported three personal social capital outlets: social media networking sites, friends, and family members. Personal social capital outlets accounted for one quarter (25.3%) of the total relational resources, with 42 participants mentioning one of these three categories at least once. Thirty-two participants (29.9%) noted electronic social media networking, including Facebook, chat forums, email, and other social media networking sites, as being personal social capital outlets. In addition, nine participants (8.4%) mentioned friends as a personal social tie and seven participants (6.5%) reported family members, including parents, partners, and immediate family, as personal social ties (see Table 2).

Mobilized personal social capital. Personal social ties provided participants with a variety of resources to support them in achieving their goals. Response frequencies are provided in the paragraphs below. Some participants noted more than one mobilized resource per social tie outlet. For example, a participant may have listed "academic-related centre" as a social tie outlet,

indicating that he or she received "writing help" as well as "advice" from this tie. Thus, frequencies for resources may be higher than those listed for naming a social tie outlet.

Through social media networking, participants were provided with an opportunity to stay in touch with friends and family (*n* = 22; 20.6%) and obtain emotional support and encouragement from friends (*n* = 3; 2.8%): "Connect with more friends that I cannot always see. Makes me feel more people are available" and "able to stay in touch with more friends so increases sense of social support." These outlets also were useful for school-related information such as seeking information, obtaining research material, and gaining personal experiences from others to solve problems (*n* = 13; 12.1%). One participant noted, "Since my dad lives far away and is constantly traveling I use the internet frequently to keep in contact with him. He always has great advice."

Friends provided participants with advice and information about university programs, classes, and finances (*n* = 5; 4.7%); writing and editing assistance for course papers and studying help (*n* = 4; 3.7%); and companionship and fun (*n* = 2; 1.9%).

Finally, family members assisted participants with writing papers, setting goals, and organizing needs (*n* = 4; 3.7%); advice (*n* = 3; 2.8%); emotional support (*n* = 1; 0.9%); and motivation (*n* = 1; 0.9%). When describing the help she received from her mother, one participant noted, "she reads over papers, corrects spelling, punctuation, tells me areas that do not make sense" and "reads

over assignments before I start them to help me get a direction or to make sure I understand them clearly."

Institutional social capital outlets. Participants reported eight institutional social capital outlets: academic-related centres, university general services, university personnel, off-campus activities, health and counselling services, community organizations, on-line connections, and non-university personnel. Institutional social capital outlets accounted for three quarters (74.7%) of relational resources reported; 83 participants mentioned one of these categories at least once.

Forty-six participants (43%) mentioned academic-related centres as an outlet for institutional social capital. University student development, learning, and disability centres made available to students a variety of institutional social ties including counsellors, learning strategists, and tutors. Twenty-one participants (19.6%) reported university general services as an institutional social capital outlet. They accessed a variety of institutional social ties through campus groups—religious and non-religious student groups, intramural teams, student clubs and advocacy groups, mentorship and internship programs, faculty–student associations, career services, financial aid centres, and outreach centres. Nineteen participants (17.8%) listed university personnel as institutional social ties. These included deans or department heads, professors or teachers, academic advisors, and teaching assistants and tutors. Seventeen participants (15.9%) reported off-campus activities, including recreation, religious outlets, employment, and volunteering, as an outlet for institutional social capital. Seventeen participants

(15.9%) reported health and counselling services as an institutional social capital outlet. Ties accessed through these services included counsellors, therapists, psychiatrists, psychologists, and doctors. Ten participants (9.3%) listed community organizations, including learning disability associations, local centres, and government groups as an institutional social capital outlet. Six participants (5.6%) noted on-line connections (e.g., class-related social media networking sites, forums, email) as an outlet for institutional social capital. Six participants (5.6%) reported connecting with people outside the university personnel realm, including a dyslexia instructor, boss, banking advisor, and students with similar difficulties to their own.

Mobilized institutional social capital. Institutional social ties provided participants with a variety of resources to support them in achieving their goals. Social ties within academic-related centres provided participants with assistance managing their disability through accommodations (*n* = 33; 30.8%). Exam accommodations and specialized supports provided participants with quiet personal space to take tests and extra time to complete exams: "I write my exams in their offices with extended time plus priority scheduling of classes." Participants received adaptive supports, audio textbooks, and note takers through these ties. Assistance in strengthening learning skills (*n* = 18; 16.8%) included receiving help improving study habits, time management, organization, and writing as well as being encouraged to explore learning alternatives and strategies. Ties also provided participants with general advice and planning support (*n* = 11; 10.3%), emotional support (*n* = 2; 1.9%), and financial support (*n* = 2; 1.9%).

Ties within university general services supported participants in developing their organization and decision-making skills by offering advice about course and program directions and helping plan participants' future education (*n* = 11; 10.3%): "possible directions for my degree and future career opportunities." Ties also provided social support (*n* = 6; 5.6%) through the deepening of friendships with participants and offering participants a feeling of community through connecting with peers. Participants received goal setting support (*n* = 6; 5.6%) from the ties they consulted through career services. These ties shared their expertise by discussing career goals, directions, and plans as well as offering assistance in job searches and making participants aware of job postings. One participant noted that her involvement in a mentorship program offered her a "connection with mentors/professors to learn about career options." A few participants mentioned that these ties provided help finding solutions to problems and dealing with human rights violations (*n* = 3; 2.8%); financial advice and help applying for grants, government funds, and loans (*n* = 3; 2.8%); and opportunities to stay active (*n* = 2; 1.9%).

University personnel provided participants with academic support (*n* = 10; 9.3%), including help writing or starting a paper; guidance on homework, assignments, and labs; and studying assistance and tutoring. Another common resource mobilized was advice (*n* = 8; 7.5%), including helping participants solve problems, advising on programs, sorting out school plans, and offering career counselling. These ties also provided participants with assistance in communicating with faculty members, working toward changing policies to help

future students with RD, and dealing with human rights violations (*n* = 3; 2.8%). Some participants noted receiving general help in and out of the classroom from their ties (*n* = 3; 2.8%): "I have some very strong relationships with past teachers and whenever I need help, they're there."

Social ties through off-campus activities provided participants with opportunities to relax and de-stress through outings, social activities, and time to "socialize with like-minded people" (*n* = 11; 10.3%). One participant reported, "I work in a very fast pace and fun environment and whenever I need support or help for a problem or school work there is always someone to help me." Some participants noted that these ties offered support for goals, motivation, and leadership development (*n* = 7; 6.5%); emotional support (*n* = 4; 3.7%); and financial support (*n* = 2; 1.9%). Also, offering support to their community through volunteering opportunities provided participants with "a sense of usefulness within the community" (*n* = 3; 2.8%).

Health and counselling service ties provided participants with mental health support (*n* = 7; 6.5%), such as help dealing with anxiety, check-ins for their mood, advice on medical related issues, and information on anxiety; counselling services (*n* = 4; 3.7%; e.g., "counselling and support to deal with the situation and assist with my learning disability"); and opportunities for discussing and receiving advice on personal issues (*n* = 4; 3.7%). One participant noted that she talked to her tie "about life stressors, healthy coping skills to deal with academics" and another mentioned that "she is there to listen to me when I need help or I need to

work something out." Social ties also provided emotional support (*n* = 2; 1.9%) and coping strategies (*n* = 2; 1.9%).

Community organization ties provided participants with social and emotional support (*n* = 4; 3.7%), help accessing general services (*n* = 4; 3.7%), opportunities for discussions and asking "expert advice from people in industry/sector" (*n* = 3; 2.8%), and assistance with career goals and ambition (*n* = 2; 1.9%).

Through on-line connections, professors and students answered participants' questions (*n* = 4; 3.7%), provided emotional support and goal recognition (*n* = 2; 1.9%), and offered feedback (*n* = 1; 0.9%).

Non-university personnel ties provided participants with ways to gather information or problem solve (*n* = 3; 2.8%): "discuss/work through common problems," "talk about places we can get help or share ideas," and "I will talk to a disabled person about disability—further information." Some participants reported that ties offered general guidance (*n* = 3; 2.8%), financial advice (*n* = 1; 0.9%), and emotional support (*n* = 1; 0.9%).

Does the Status of Personal and Institutional Social Ties Explain Academic Achievement?

To answer this question, we focused on social capital questions from the Goal-Network Inventory. Table 3 shows correlations among background variables, social capital-employment status, social capital-student ranking, and academic achievement. Statistically significant correlations included a negative relationship between academic achievement and past and current RD, indicating

that university students with RD reporting greater reading difficulties had lower academic achievement than those with fewer difficulties. Academic achievement correlated positively with social capital-student ranking, indicating that higher achieving participants reported ties with higher achieving students. Social capital-employment status correlated positively with mother and father's education, indicating that participants reporting ties with higher employment status had parents with higher levels of education than those reporting lower status ties.

We conducted hierarchical multiple regression analysis to (a) control for history of RD and parental education and (b) to examine the unique contribution of the social capital variables (i.e., employment status and student ranking) in explaining academic achievement. In Step 1, we entered background characteristics (past and current reading difficulties and parental education); thus, history of RD and parental education were controlled in the regression analysis (see Sandefur, Meier, & Campbell, 2006, and Stanton-Salazar & Dornbusch, 1995). In Step 2, we entered social capital-employment status and social capital-student ranking.

Regression results are presented in Table 4. Control variables accounted for 19.0% of the variance in academic achievement, $F(4,71) = 4.16$, $p = .004$, with history of RD variables (Elementary and Current) being significant, but not parental education: the more reading difficulties participants reported in the past and currently, the lower their GPA. The social capital variables (social capital-employment status and social capital-student ranking) accounted for a significant 7.8% of additional variance in academic achievement, $F(6, 69) = 4.20$, $p = .031$,

although only social capital-employment status made a unique significant contribution: the higher the social capital-employment status, the higher the GPA.

Discussion

We examined what kinds of social ties support university students with RD in achieving their goals, social tie outlets, resources mobilized within these relationships, and the impact of ties' status in explaining academic achievement. Our results indicated, first, that the majority of university students with RD named friends, parents, and significant others (e.g., boy/girlfriend, spouse) as supportive ties, consistent with previous research with non-RD individuals (e.g., Jokisaari & Nurmi, 2005; Phillips et al., 2001; Tynkkynen et al., 2010). In our network survey, social ties we classified as institutional social capital, including school personnel or professionals and acquaintances, were mentioned less often with less than one third of participants listing these as supportive social ties. This is in line with previous research in which young adults transitioning from school to work and engaging in career decision-making mentioned students, school personnel, and teachers or counsellors less often than close personal ties (Jokisaari & Nurmi, 2005; Phillips et al., 2001).

One reason for the high number of close personal ties and low number of institutional ties reported may be the method we used to collect this data. Although name generators, such as the Goal-Network Inventory used in this study, are commonly used to obtain social network information, they are not without problems. Name generators tend to elicit names of close ties (Campbell & Lee, 1991; Marin, 2004). Also, the restrictions we set by limiting contacts to

five and the time frame to within the past 6 months likely reduced the number and type of social ties participants listed (Campbell & Lee, 1991). To compensate for this bias, Burt (1997) recommended using multiple name generator questions. In this study, we used the Goal-Network Inventory as well as a second open question about other resources participants use to achieve their goals. Because this second question asked about "other resources," it was biased towards eliciting institutional social ties. Together the questions provide an understanding of the ties and resources university students with RD use to support them in achieving their goals.

Second, university students with RD in our study reported accessing personal social capital through social media networking sites, friends, and family members, and institutional social capital through academic-related centres, university general services, university personnel, off-campus activities, health and counselling services, community organizations, on-line connections, and non-university personnel. As the question asked participants to list "other resources" that supported them in meeting goals, the personal social ties they listed in the Goal-Network Inventory are less likely to be found in this question. However, this question allowed us to examine the richness of social capital found within participants' universities and communities. Resources mobilized among personal and institutional social ties included emotional and social support, advice and planning, writing and studying help, and goal setting. Institutional social ties also afforded job search assistance, accommodations, skill development, financial support, and mental health services. These findings provide valuable information

to universities in terms of encouraging students to share experiences of what works for them and what is available if one goes looking.

Finally, we found that the status of employed, but not student, social ties explained unique variance in academic achievement, over and above history of RD and parental education. This finding reflects previous research in which having higher status ties was linked to experiencing positive outcomes for adults without RD (e.g., Harper, 2008; Jokisaari & Nurmi, 2005). One explanation is that social ties in higher occupational positions have access to advantageous resources and connections (Lin, 1999), which in turn help university students with RD experience academic success through resource transmission. Another explanation is that parental socioeconomic status or education may positively impact academic outcomes (Huang, 2009; Stanton-Salazar & Dornbusch, 1995) by providing students with access to social capital and high status contacts (Sandefur et al., 2006). In our analyses, however, we controlled for parental education and found that it did not significantly add to the variance in academic achievement. A third possibility is that higher educational expectations lead to positive educational outcomes (Stanton-Salazar & Dornbusch, 1995). There is growing evidence to suggest that having high expectations and persevering to meet these expectations are important characteristics of successful adults with RD (e.g., Corkett et al., 2008; Hellendoorn & Ruijssenaars, 2000). Relevant to the current study, perseverant university students with RD may seek ties with access to advantageous resources as well as push themselves to achieve academically. These hypotheses warrant further empirical validation.

We also found a significant, albeit small, correlation between social capital-student ranking and academic achievement, consistent with previous research in which adolescents (e.g., Kiuru et al., 2011; Nichols & White, 2001) and graduate students (i.e., Lomi et al., 2011) from the same peer group shared a similar level of academic achievement, suggesting social selection. However, unlike in Lomi et al.'s (2011) study that found students to assimilate to the academic performance of their ties—having ties with performance higher than oneself provided an upward pull—we failed to find support that having higher achieving student social ties explained academic achievement for university students with RD. This may be due to the lack of variance in the social capital-student ranking variable. That is, of the 83.2% of participants who listed a student social tie, the mean for social capital-student ranking was 1.27 (*SD* = .52; 1 = above average student to 3 = below average student), with 76.4% listing at least one high-achieving student social tie.

Limitations, Implications, and Future Directions

This study has limitations that must be considered. First, an inclusion criterion for this study was a self-reported history of RD rather than a formal diagnosis. However, findings from Parrila, Georgiou, and Corkett's (2007) study of university students with a history of RD—as well as research by Schulte-Korne, Deimel, and Remschmidt (1997), McGonnall, Parrila, and Deacon (2007), and Deacon, Cook, and Parrila (2012)—suggest a self-report measure of RD is a viable alternative when formal diagnosis is not possible. Second, we were interested in examining the presence of social ties and resources available to

university students with RD in helping support their goals. Social capital, however, is a multidimensional construct, also depending on quality of relationships (Szreter, 2000). Although we did not provide a multipronged examination of social capital, the findings do provide insight about the social ties that university students with RD access to support them in achieving their goals and the resources mobilized within these relationships. Finally, as our sample consisted only of RD individuals, we were unable to systematically compare them to a non-RD group.

Notwithstanding these limitations, the findings from this study have important implications for educators and service providers working with university students with RD. Previous research has found that availability of supports and services are critical to the success of postsecondary students with RD (Stodden et al., 2001). In the current study, university students with RD reported a variety of personal and institutional social ties and resources as being supportive. A necessary step for postsecondary institutions is to consider ways to help to develop social capital of university students with RD (e.g., exploring who to seek for help, how to build relationships with students and non-students; DaDeppo, 2009). Thus, instructors, learning strategists, and others working with adolescents and university students with RD should consider how to complement the development of learning strategies and skills with coaching on ways to seek out resources and encourage the development of a range of social ties on and off campus. Further, little workplace support is available for adults with RD (Bell, 2009). Building a foundation of supports during postsecondary education may

help transfer supports to activities after graduation. An investigation into how supports developed in postsecondary education transfer to workplace settings for adults with RD is necessary.

We propose several areas for future research. First, Brigg's (1998) distinction between social capital that helps one cope with a situation (i.e., social support) versus social capital that helps one advance (i.e., social leverage) may be an important next step in understanding the impact of different functions of social capital on the outcomes and well-being of university students with RD. Further, longitudinal research designs would provide a more detailed picture of social capital functions, social tie outlets, types of resources mobilized, and changes that may occur within these functions, outlets, and resources over time by university students with RD.

A second area is the potential for providing support to university students with RD via online social media networking. In a study examining how children with learning disabilities present themselves on a website for people with learning disabilities, children readily discussed difficulties and asked for help, and the website provided a safe and comfortable environment for self expression and mentor support (Raskind, Margalit, & Higgins, 2006). With internet networks being a source of reciprocal support for adults without RD (e.g., Ellison, Steinfield, & Lampe, 2007), future research may wish to investigate the impact of these types of exchanges with university students with RD.

Conclusion

The results of this mixed-method study suggest that university students with RD use a variety of social ties and resources to support them in achieving their goals. Moreover, the employment status of their social ties plays a role in their academic achievement, above history of RD and parental education. Given the importance of accessing valuable supports and resources to support goal achievement, university students with RD should be encouraged to build relationships with students and non-students and seek out sources of support on and off campus.

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Table 4-1
Percentage of Participants who Named Each Social Category at Least Once

Social Tie Category	%	Examples of Social Ties
	Personal	
Friend	93.5	friend, best friend, ex-boyfriend, ex-girlfriend
Parent	79.4	father, mother
Significant other	51.4	boyfriend, girlfriend, common law partner, fiancée, husband, wife, spouse, partner, significant other
Sibling	39.3	sister, brother
Extended family	10.3	grandma, mother-in-law, father-in-law, cousin, aunt, daughter, son
	Institutional	
School personnel or professionals	19.6	counsellor, campus staff worker, professor, high school teacher, academic advisor, supervisor, boss, student advocate, therapist, Chaplain, Rabbi
Acquaintances	12.1	school friend, classmate, peer, roommate, colleague, co-worker

Table 4-2

Sources of Personal and Institutional Social Ties and Resources Mobilized

Category	*n* social ties (%)	Examples of Social Ties	Examples of Mobilized Resources
		Personal Social Capital	
Social media networking	40 (17.8)	Facebook, chat forums, email, other social media networking sites	social support, emotional support and encouragement, information
Friends	10 (4.4)	Friends	advice, help with writing/editing and studying, companionship/fun
Family	7 (3.1)	Parents, partners, immediate and extended family members	writing help and setting goals, advice, emotional support, motivation
		Institutional Social Capital	
Academic centres	52 (23.1)	Student develop and disability services and learning/writing centre	accommodations, skill development, advice and planning, emotional support, financial support
University general services	29 (12.9)	Religious and non-religious student groups, intramural teams, student clubs and advocacy, mentorship and internship programs, faculty–student associations, career services, financial aid centre, and information and outreach centres	advice and academic support; social support; goal setting and career planning; problem solving; financial advice; staying active
University personnel	24 (10.7)	Deans or department heads, professors or teachers, academic advisors, and teaching assistants and tutors	help with writing, assignments, studying; advice; communication; general help
Off-campus activities	19 (8.4)	Recreation, religious outlets, employment, and volunteering	opportunities to relax and socialization; goals, motivation, leadership skills; emotional support; financial support; sense of usefulness in community
Health and counselling services	18 (8.0)	Counselling services, health centres, student distress centre	mental health support, counselling, advice, emotional support, coping strategies
Community organizations	12 (5.3)	Learning disability associations, local centres, and government groups	social/emotional support, general help, discussions and advice, career goals
On-line connections	7 (3.1)	Class-related social media networking sites, forums, school-related email	answers to questions, emotional support and goal recognition, feedback
Non-university personnel	7 (3.1)	Dyslexia instructor, boss, banking advisor, other students	information and problem solving, advice, emotional support
Total	225 (100)		

Table 4-3

Correlations among Variables

Variables	Age	Mother Education	Father Education	RD Elementary	RD Current	Parent RD	Sibling RD	Family RD	Social Capital Employ. Status[4]	Social Capital Student Ranking[5]	GPA
Gender[1]	-.18	-.00	.08	.09	-.11	.03	-.06	-.06	.01	- .09	.07
Age		-.26**	-.42***	.11	.09	.16	-.12	.14	-.13	.00	-.03
Mother education[2]			.50****	.04	-.19	-.06	.00	.08	-.23*	- .11	.18
Father education[2]				.00	-.16	-.31**	.05	-.07	-.21*	.09	.09
RD Elementary					.25**	.29**	.12	.18	-.03	.07	-.21*
RD Current						.10	.08	.19	.05	.06	-.35***
Parent RD[3]							.15	.15	.19	.00	-.10
Sibling RD[3]								-.08	.03	- .04	-.04
Family RD[3]									-.08	- .19	-.05
Social capital employment status										.01	-.19
Social capital student ranking											-.23*

Note. [1]0 = male, 1 = female; [2]1 = no high school, 2 = high school/some college, 3 = business school/junior college, 4 = college graduate/bachelor's degree, 5 = graduate degree; [3]0 = no RD, 1 = RD; [4]lower score = higher employment status; [5]1 = above average student, 2 = average student, 3 = below average student.

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 4-4

Hierarchical Multiple Regression Analysis Predicting Academic Achievement

Variables	β	*t*	R^2	Δ R^2
Step 1			.19**	.19
Reading difficulties - elementary	-.27	-2.416*		
Reading difficulties - current	-.24	-2.081*		
Education - mother	.13	0.998		
Education - father	-.04	-0.288		
Step 2			.27**	.08
Social capital employment status	-.25	-2.360*		
Social capital student ranking	-.13	-1.222		

Note. *$p < .05$, **$p < .01$.

CHAPTER V. GENERAL DISCUSSION

In this dissertation, I (a) assessed the impact of intrapersonal and interpersonal resilience, persistence, and number of difficulties on different aspects of life satisfaction and academic achievement (Chapter II); (b) tested three different models to understand the impact of number of difficulties, social support, and community support on life satisfaction and academic achievement (Chapter III); and (c) explored the goal-related social ties and resources that support adults with RD in achieving school and work goals, as well as the impact of social tie status on academic achievement (Chapter IV).

The extant resilience and learning disabilities literature has emphasized the importance of considering the interrelationships between the individual, family, social network, and community contexts (e.g., Gerber, Ginsberg, & Reiff, 1992; Margalit, 2003; Spekman, Goldberg, & Herman, 1993). Yet, few studies have investigated factors related to success from a multidimensional viewpoint. The studies in this dissertation sought to extend this work by using intrapersonal and interpersonal factors to explain different aspects of life satisfaction and academic achievement for adults with RD. Below I will summarize and discuss findings from the three studies presented in this dissertation at the individual, family and social network, and community levels.

Individual Level Findings

The existing literature examining positive outcomes for adults with learning disabilities, including RD, suggests intrapersonal characteristics are important for promoting successful outcomes (e.g., Corkett, Hein, & Parrila,

2008; Gerber et al., 1992, Goldberg, Higgins, Raskind, & Herman, 2003; Hellendoorn & Ruijssenaars, 2000; Spekman, Goldberg, & Herman, 1992). I examined intrapersonal factors (i.e., perceptions of self, perceptions of future, and structured style) in relation to life satisfaction and academic achievement in Chapter II. Intrapersonal resilience corresponded positively to persistence, suggesting that adults with RD who persist in meeting their goals also believe in their abilities and make plans to elicit positive outcomes. Intrapersonal resilience was also associated with interpersonal resilience, indicating that adults with RD who have access to protective factors in one domain are likely to have access to protective factors in other domains (Hutchinson, Freeman, Stoch, & Chan, 2004; Werner, 1993). Consistent with previous research in which self-esteem, an intrapersonal component of resilience, positively corresponded with self life satisfaction (Alfonso, Allison, Rader, & Gorman, 1996), and intrapersonal resilience explained general life satisfaction and self life satisfaction. Thus, adults with RD with greater intrapersonal resources are more satisfied in general and in relation to self than those with less access to these resources.

Growing evidence suggests persistence is an important characteristic of successful adults with learning disabilities (e.g., Gerber et al., 1992; Raskind, Goldberg, Higgins, & Herman, 1999; Spekman et al., 1992). In Chapter II, a small correlation existed between persistence and self life satisfaction, although persistence did not significantly explain any life satisfaction variables. While persistence is assumed to be a positive characteristic, some university students with learning disabilities report being persistent to counteract pressure from

parents, to verify their worth to others, or to prove other's low expectations wrong (Corkett et al., 2008; Greenbaum, Graham, & Scales, 1995; Litner, Mann-Feder, & Guérard, 2005). Additional empirical work would be useful to determine how persistence activated by reacting to the demands of others or needing to prove others wrong influences life satisfaction and other outcomes.

In contrast to previous research where persistence predicted GPA in samples without known RD (e.g., Duckworth, Peterson, Matthews, & Kelly, 2007; Houser-Marko & Sheldon, 2006), neither persistence nor intrapersonal resilience were related to academic achievement in Chapter II. One explanation can be taken from Duckworth et al.'s (2007) finding that when using SAT scores as a measure of general mental ability, students with lower ability reported higher persistence, suggesting less bright students may compensate by working harder. Further, when situations are doomed or tasks are impossible, continuing to persist may increase effort, cost, and time without the possibility of leading to positive outcomes. Indeed, successful adults with learning disabilities are flexible in decision-making and explore multiple paths (Goldberg et al., 2003).

Experiencing disabilities or impairments in addition to RD is common for adults with RD (Gerber et al., 1990; Hellendoorn & Ruijssenaars, 2000; Nielsen, 2001). In the current studies, the number of difficulties reported in addition to RD was negatively associated with perceived social support (Chapter III), with intrapersonal and interpersonal resilience (Chapter II), and with life satisfaction factors, suggesting that adults with RD reporting a greater number of difficulties have less access to resources and are less satisfied. These findings are in line with

the results reported by Martínez (2006) who found students with a difficulty in addition to RD scored higher in the sense of inadequacy and lower in perceived social support than those with one or no learning disability.

Students with multiple disabilities may be at increased risk for negative outcomes as young adults (Willcutt et al., 2007). Given that problems of learning difficulties can be exacerbated in adulthood (Collinson & Penketh, 2010; Gerber et al., 1990) and external supports are linked to well-being (Hellendoorn & Ruijssenaars, 2000), it was expected that the greater the number of difficulties, the greater the positive impact of social and community support (Chapter III). In contrast to this expectation, social support and community support failed to moderate the relationship between number of difficulties and life satisfaction, lending no support to the buffering effect hypothesis. Cohen and Wills (1985) reasoned that measures that elicit general availability of support, without assessing specific resources, are likely to result in a main effect without buffering interactions. The buffering effect model is most effective when the type of support matches the challenges that accompany the stressor (Cohen & Wills, 1985). It is plausible, then, to assume that items measuring perceived social and community support in our study did not match well with the needs associated with having a greater number of difficulties in addition to RD. This area would benefit from further research that measures general and specific support variables related to the challenges of having difficulties in addition to reading problems.

Also in Chapter III, I proposed a model in which social support and community support would mediate the relationship between number of difficulties

and life satisfaction or academic achievement. Variable correlations showed that community support did not correlate significantly with number of difficulties; therefore, community support was not included as a mediator in this model. The number of difficulties reported in addition to RD negatively corresponded with social support and life satisfaction (see also Martínez, 2006)—the greater the number of difficulties, the lower the perceived social support and life satisfaction. In the mediation model, social support partially mediated the relationship between number of difficulties and life satisfaction, suggesting that reduced social support may be one mechanism by which number of difficulties is linked with life satisfaction (see also Quittner, 1992).

Social Level Findings

The literature examining positive outcomes for adults with learning disabilities, including RD, has indicated that interpersonal characteristics play a role in promoting successful outcomes (e.g., Corkett et al., 2008; Gerber et al., 1992; Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Spekman et al., 1992; Werner, 1993). In Chapter II, interpersonal resilience (i.e., family cohesion, social resources, and social competence) explained social life satisfaction, with social competence being a strong predictor. Further, in Chapter III, perceived social support—from family, friends, and significant others—significantly explained life satisfaction, a result consistent with previous research showing adults without RD with higher perceived social support experience higher life satisfaction (e.g., Herrero, Fuente, Gracia, 2011; Matheny et al., 2002;

Sheldon & Hoon, 2007), and partially mediated the relationship between number of difficulties and life satisfaction.

When asked about the social ties that supported them in achieving their school and work goals, adults with RD named parents, siblings, spouses, extended family members, and friends as important personal social ties (Chapter IV). These personal social ties provided emotional and social support, advice and planning, writing and studying help, and goal setting. A small significant correlation existed between social capital-student ranking and academic achievement, which is consistent with previous research in which students from the same peer group shared a similar level of academic achievement (e.g., Lomi, Snijders, Steglich, & Torló, 2011). Also, similar to previous research in which having higher status ties was linked to experiencing positive outcomes for adults with no known RD (e.g., Jokisaari & Nurmi, 2005), status of employed ties uniquely explained academic achievement. These findings hint that support from social ties may play a role in the educational success of adults with RD. Further empirical studies are required to confirm this explanation.

Contrary to expectations, all three studies in this dissertation poorly explained academic achievement. Interpersonal variables (family cohesion, r = .03; social resources, r = .01; social competence, r = .03, Chapter II) and perceived social support (r = -.01, Chapter III) did not correlate with academic achievement. Also, I failed to find evidence that having higher achieving student ties improved academic achievement for adults with RD (Chapter IV), unlike in

Lomi et al.'s (2011) study where ties with performance higher than oneself provided an upward pull.

There may be several reasons for the lack of impact of social supports on academic achievement. First, the studies in chapters II and III focused on support of close relationships, not institutional supports, such as professors, disability service professionals, or tutors that may have a different impact on academic achievement. Although we started to learn about the role of institutional relationships in achieving goals through participants' qualitative responses (Chapter IV), 84.1% of the social ties in the analysis of employment status predicting academic achievement were personal social ties. Second, measures in chapters II and III asked about support available to help make decisions or discuss problems, for emotional support, or for general help. While these forms of support are important to life satisfaction, I did not ask about supports available for academic issues, which may translate more directly to academic outcomes. Third, I used GPA to represent educational success, whereas some studies evaluated success based on college degree completion (Vogel & Adelman, 1992), highest grade achieved (Raskind et al., 1999), a 3.0 GPA or better (Scott & Scherman, 1992), or what helped participants during college (Greenbaum et al., 1995). Thus, measurement discrepancies may result in differences in findings (Nicpon et al., 2006; Robbins, Lauver, Le, Davis, & Langley, 2004). Finally, as with Nelson and Gregg's (2012) sample, the sample of adults completing a university degree or the recent graduates in the current study may be a unique higher-functioning subpopulation who have developed coping skills to compensate for difficulties.

Indeed, I found the number of difficulties participants reported in addition to RD did not correlate with academic achievement. This suggests that although 92% of adults in our study reported having at least one additional difficulty, and 58% reported 2–4, an increased number of difficulties did not have a significant negative impact on academic achievement.

Community Level Findings

Reflecting O'Connor and Jose's (2012) finding that participation in community activities corresponded with greater social support, higher social support corresponded with higher community support in Chapter III. Although the impact of community support on life satisfaction did not reach significance in the full model, there were positive small correlations between the community support and life satisfaction subscales. A model including only community support and life satisfaction showed a small positive path estimate from community support to life satisfaction; however, the effect was suppressed when social support was entered into the model, suggesting that social and community support explain overlapping variance in life satisfaction, with social satisfaction being the stronger predictor. In Chapter IV, participants reported accessing institutional social capital through academic-related centres, university general services, university personnel, off-campus activities, health and counselling services, community organizations, on-line connections, and non-university personnel. Institutional social ties provided emotional and social support, advice and planning, writing and studying help, and goal setting, similar to personal social ties, as well as afforded job search assistance, accommodations, skill

development, financial support, and mental health services. These findings suggest that the community context can be a source of support for adults with RD, and it is possible that the measures used in Chapter III did not fully capture the impact of community support.

Considering Findings within the Multiple Systems Model of Reading and Risk and Resilience Perspective

To situate the series of studies in this dissertation, I used a framework developed from the Multiple Systems Model of Reading (Parrila, 2008), coupled with the risk and resilience perspective (Margalit, 2003; Masten & Garmezy, 1985; Werner, 1993; Wong, 2003). In the Multiple Systems Model of Reading, Parrila (2008) proposed bidirectional relationships between five systems—environment, psychological, behaviour, neural, and genetic—leading to reading and academic outcomes. In this dissertation, I examined factors in the psychological and environmental systems. The risk and resilience perspective also posits that people develop in a setting of interconnected systems (Margalit, 2003; Murray, 2003; Pianta & Walsh, 1998). In this dissertation, I examined variables within individual, family and social network, and community contexts.

The findings from the studies presented in this dissertation lend support to the notion that to understand the complexities of resilience (Masten & Garmezy, 1985; Pianta & Walsh, 1998) and the outcomes of adults with RD (Parrila, 2008), researchers must investigate risk and protective factors in combination, using factors across multiple domains. Individual level factors contributed to life satisfaction and were positively associated with social level factors (Chapter II),

and social level factors were positively associated with community level factors in explaining life satisfaction (Chapter III). Supports at both the social and community level were reported to help adults with RD achieve their school and work goals (Chapter IV). Taken together, these findings suggest that variables at multiple levels and in multiple domains together influence individual outcomes.

Limitations

Limitations across studies are worth noting. First, because participants in the studies included adults completing a university degree or who were recent graduates, sample representativeness is likely limited to adults with RD in postsecondary settings. Second, samples consisted only of individuals with RD, so I was unable to compare them to a non-RD group. Third, inclusion criterion for all three studies was a self-reported history of RD, rather than a formal diagnosis. However, findings from Parrila, Georgiou, and Corkett's (2007) study of university students with a history of RD—as well as research by Schulte-Korne, Deimel, and Remschmidt (1997), McGonnell, Parrila, and Deacon (2007), and Deacon, Cook, and Parrila (2012)—suggest a self-report measure of RD is a viable alternative when formal diagnosis is not possible. Fourth, the self-selected samples leave room for speculation that participants may differ from others with RD who did not volunteer to take part in the research in this dissertation.

Future Research

The research presented in this dissertation examined multiple protective factors, within and across studies, for adults with RD. Based on the findings of this work, several areas of future research are considered. The social support and

social resources measures in chapters II and III asked about support available to help make decisions or discuss problems, for emotional support and comfort, or for general help—but not academic support. I only began to uncover the provision of academic supports in Chapter IV. Future studies may wish to ask adults with RD specifically about the academic support they seek and receive from their social ties.

In Chapter II, persistence was positively correlated with the resilience scales of perceptions of self, perceptions of future, and structured style as well as self life satisfaction. However, persistence did not correlate with academic achievement. Although persistence is considered beneficial for meeting goals, when situations are doomed or tasks are impossible, continuing to persist may increase effort, cost, and time without the possibility of leading to positive outcomes. Thus, it may be important for adults with RD not only to persist during difficult tasks, but also to know when to employ a more appropriate strategy—rather than simply persisting no matter what (Janoff-Bulman & Brickman, 1982; McFarlin, 1985). Thus, it would be useful to combine persistence measures with cognitive flexibility and adaptiveness measures (see Cantwell, 1998; Cantwell & Moore, 1996; and Cantwell & Scevak, 2004) in future studies.

With the research presented in this dissertation, along with past research on the impact of social supports for adults with learning disabilities (e.g., Corkett et al., 2008; Gerber et al., 1992; Goldberg et al., 2003; Hellendoorn & Ruijssenaars, 2000; Spekman et al., 1992), as researchers, we are only beginning to understand the importance and role that social support has in relation to

positive outcomes for adults with RD. Future research should further examine—qualitatively and quantitatively—the role that institutional social ties, such as professors, disability service professionals, or tutors, play in the academic achievement of adults with RD. Moreover, future research could investigate the impact of different functions of social capital. Briggs (1998) distinguished between social capital that helps one cope with a situation (i.e., social support) versus social capital that helps one advance (i.e., social leverage). From the findings in this dissertation, it is difficult to differentiate between supports that help adults with RD cope with situations versus help them advance. It is plausible that supports that help adults with RD advance, rather than cope, are important to their academic achievement. There is also the potential for examining support provided to adults with RD via online social media networking. With internet social networks being a source of reciprocal support for adults without RD (e.g., Ellison, Steinfield, & Lampe, 2007), future research may wish to investigate the impact of online exchanges with adults with RD, and whether these exchanges function as social support or social leverage.

Future research on community support of adults with RD should explore what community means to them, how they are involved in their community, and the ways they feel supported by community activities, participation, and organizations. Finally, to gain a better understanding of how resilience variables, life satisfaction, and academic achievement relate over time, future studies should assess adults with RD at two or more points in time. As with many other areas of educational research, longitudinal studies are needed to better understand the

possibly variable relationships between the interpersonal, intrapersonal, and community resources and different positive and negative life outcomes.

Implications

Adults with RD who attend postsecondary education often experience additional demands compared to adults without RD (Nalavany, Carawan, & Rennick, 2011; Rochette & Loiselle, 2012). Hence, support and service availability is assumed critical to the success of these students (Stodden, Whelley, Chang, & Harding, 2001). The findings from this dissertation have important implications for educators, on-campus personnel, and service providers working with adults with RD as well as for adults with RD themselves.

The studies in this dissertation demonstrate that social support contributes to life satisfaction and a greater number of difficulties is linked to lower perceived social support, intrapersonal and interpersonal resilience, and life satisfaction for adults with RD. These findings suggest that individuals working with adults with RD consider providing holistic supports, focused on support relevant to students' social and emotional needs in addition to academic skills. Supports may take the form of relationships with family, friends, and significant others, as well as with university and community connections available to help make decisions or discuss problems, provide emotional support, or for general assistance.

A necessary step for postsecondary institutions is to consider ways to help develop the social capital of adults with RD (e.g., exploring who to seek for help, how to build relationships with students and non-students; DaDeppo, 2009). Thus, instructors, learning strategists, and others working with adolescents and

adults with RD should consider how to complement the development of learning strategies and skills with coaching on ways to seek out resources and encourage the development of a range of social ties on and off campus. Further, it is important for professors and others working on campus to know how important it is that they comprehend their students' needs and make resources available to them so as not to compromise the quality of their students' university experience.

Research indicates that little workplace support is available for adults with RD (Bell, 2009). Building a foundation of supports during postsecondary education may help transfer supports to activities after graduation. An investigation into how supports developed in postsecondary education transfer to workplace settings is necessary. Finally, it is essential that adults with RD understand the importance of developing supportive relationships with close ties and institutional supports. Given the importance of accessing valuable supports and resources to support goal achievement, adults with RD should be encouraged to build relationships with students and non-students and seek supports on and off campus to help them achieve their goals and increase their life satisfaction.

Conclusions

The findings presented in this dissertation emphasize the complexity of the relationships between psychological and environmental protective factors, investigated at multiple levels, and positive outcomes. While the studies in this dissertation respond to Gerber's (2012) call for research that examines variables at multiple levels of analysis, these studies are only a start towards developing a comprehensive model of resilience and reading difficulties.

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