CHAPTER 6

Adults with Learning Disabilities

Factors Contributing to Persistence

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Few studies exist to comprehensively inform our understanding of the adult population with learning disabilities (LD). Available outcome data primarily suggest the inequity of educational and work opportunities for these individuals (DaDeppo, 2009; Gregg, 2007; National Council on Disability, 2003; Wagner, Newman, Cameto, Garza, & Levine, 2005; Wessel, Jones, Markle, & Westfall, 2009). Understanding the factors integral to successful preparation for and engagement in postsecondary education and employment opportunities for the adult population with LD requires a critical review of the literature.

Identifying those factors significantly influencing the persistence of adult learning across educational and employment settings helps to identify the supportive networks essential for success. For instance, some adults want to pursue technical fields of study but do not persist because of competing demands on their time, economic restrictions, or unsatisfactory past academic experiences that do not support engagement in current postsecondary settings. The nature of an individual's resilience and susceptibility to risks is the result of a variety of internal and external variables. While understanding how intrinsic psychological factors influence an individual's persistence, the importance of environmental variables is also central to explaining adult outcomes (Anderman & Anderman, 2000).

Defining the Adult Population with LD

The federal definition for an adult with LD describes an individual who is developmentally disordered in learning compared to age-expected behaviors, and requires evidence that the individual be substantially limited in major life activities (Gregg, 2009b). However, as noted by Barkley (2006), affective, cognitive, language, and achievement abilities influence individual learning differently across the life span, highlighting the critical importance of age-specific markers for reliable and valid diagnostic decision making for the adult population with LD. Unfortunately, the diagnostic criteria set for determining the severity thresholds for symptoms, history, and behavior (emotional, cognitive, and achievement) for the adult population with LD are not mandated by law. Therefore, criteria vary significantly across research studies, postsecondary educational institutions, and employment (Gregg, 2009b). As a result of this lack of specific federally mandated eligibility criteria, the practice of identifying adults with LD has resulted in the identification of a very heterogeneous group of individuals in

relation to severity, ability, and background. This fact is critical to consider as we investigate the factors influencing the persistence of LD in the adult population.

College-Bound Individuals

At the postsecondary level, 41% of 18- to 24-year-olds are enrolled in 2- and 4-year colleges in the United States (*The Chronicle of Higher Education*, 2012). At postsecondary educational institutions, the term "historically served students" refers to individuals transitioning from secondary to postsecondary schools with little or no break in their education. Of the historically served population of students with documented disabilities, individuals with LD make up the largest group of college freshmen (National Center for Education Statistics, 2007). Among the population with LD, approximately 17% will take college entrance exams and 11% of those who graduate from high school will go on to 4-year institutions (Wagner et al., 2005). The enrollment of individuals with LD in 2- and 4-year programs continues to increase over time, with estimates ranging from 9.3% to as high as 17% (Getzel, 2008). However, these figures are substantially lower than those for college-bound students without disabilities. The greatest growth in postsecondary attendance by students with LD has been experienced at 2-year colleges (Wagner et al., 2005).

Work-Bound Individuals

Historically, less attention has been given to the career development needs of non-college-bound youth with LD because of an often perceived artificial academic focus separating school and workplace (Rojewski & Gregg, 2011; Rojewski & Kim, 2003). Certainly, the transitional outcomes for this population are at risk compared to those of nondisabled peers, as evidenced by their high dropout rates (Newman, Wagner, Cameto, & Knokey, 2009), lower postsecondary enrollment and attainment (Stodden, Jones, & Chang, 2002; Wagner et al., 2005), restricted labor force participation (Barkley, 2006), and lower earnings (Day & Newburger, 2002). According to Rojewski (1996), reduced familiarity with the demands of the workplace; lack of clear career aspirations, with impaired career maturity; and profiles of low achievement set up barriers to success in career persistence. Employment outcome studies suggest that adults with LD appear to function as well as their peers in obtaining jobs upon graduation (Rojewski, 1996). However, on face value, these statistics appear to be flawed (Gregg, 2009b). Few, if any, comprehensive studies of employment outcomes for adults with LD have ever been conducted, so that knowledge about their world of work is based primarily on anecdotal information (Young & Brown, 2005).

The majority of jobs obtained by transitioning adolescents with LD are often semiskilled and usually part-time positions (Barkley, 2006; Gregg, 2009b). Wagner and colleagues (2005) found that while 86% of young adults with LD earned more than minimum wage, only about 33% of them worked full time. No real changes in earnings were found for youth with LD from the original and the second National Longitudinal Transition Study (NLTS-2), even when wages were adjusted for inflation. It appears that the earning power gap between youth with LD and their nondisabled peers is widening as a result of growing disparities in educational attainment (Day & Newburger, 2002; Wagner et al., 2005).

Because of a paucity of empirically based research in which adults with LD have been studied across employment settings, the focus of this chapter includes individuals with LD who have pursued or successfully completed postsecondary education (either 2- or 4-year). The adults in this chapter represent populations identified using secondary or postsecondary educational and/or research criteria (e.g., cutoff or discrepancy models). The literature pertaining to unidentified people enrolled in adult basic education settings is not represented in this chapter. However, implications of adult basic education and employment settings are included in the summary of the chapter.

Risk–Resilience Factors Influencing Outcomes for Adults with LD

The research that is specific to the adult population with LD can be examined through a different lens. Historically, many professionals viewed adult population outcomes from a deficit perspective, with the problem being

individuals' inherent and unchangeable deficiencies. However, not all factors contributing to educational and career outcomes are best viewed from a deficit paradigm. The identification of resilience factors that contribute to success, as defined by features of emotional, academic, and occupational well-being for the adult population with LD, supports a more asset-driven model (Gregg, 2009b; Murray, 2003; Rojewski & Gregg, 2011; Werner & Smith, 1982). While resilience research focuses on positive outcomes, risk indicators are often inversely identified. A third causal factor then provides the bridge for a better understanding of the inverse relationship between risk and resilience (asset) variables (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). For instance, a particular type of LD (causal) might produce less stressful school experiences (risk), provide greater access to higher education (risk), lead to greater supportive resources (asset), and allow for more professional advancements (asset).

Follow-up and follow-along qualitative studies of adults with LD provide evidence for resilience and risk factors that contribute to the postsecondary outcomes for this population (Goldberg, Higgins, Raskind, & Herman, 2003; Spekman, Goldberg, & Herman, 1992). According to this body of literature, successful adults with LD (1) adapt to life events through self-awareness and acceptance of their disability, are proactive and persevere, and are emotionally stable and able to tolerate stress; (2) are goal-directed and able to set appropriate goals; (3) are able to establish and use effective support systems. These studies also suggest that LD can be a risk factor for negative outcomes such as high school dropouts, underemployment, job difficulties, emotional difficulties, and life dissatisfaction (Reiff & Gerber, 1994; Ross-Gordan, 1996). Unfortunately, follow-up and follow-along studies of adults have several significant limitations. The definitions and eligibility criteria for LD used in the childhood identification of these individuals are often not consistent with today's standards. Many of these early studies only sampled individuals with LD who were primarily white and male, from middle- to upper-middle-class families, and referred to clinics due to learning problems. While this pioneering research provides invaluable and rich observations of individuals with LD across the life span, caution must be taken in directly generalizing these findings to current populations of identified adults with LD.

Risk and resilience factors are often divided into internal and external influences. "Internal resilience factors" refer to issues that include an individual's positive temperament, recognition of his or her disability, utilization of accommodation strategies, and knowledge of ways to advocate for oneself in school or work. "External influences" are those manifestations that support the person in school or work-related decision making, including family, school, and community. Masten (2001) provides empirical evidence from the psychological literature of a set of internal and external factors most associated with the resilience construct. These factors include positive relationships with caring adults, self-regulation skills, positive self-concept, and motivation. According to Masten, "Resilience refers to a class of phenomena characterized by good outcomes in spite of serious threat to adaptation or development. Research on resilience aims to understand the processes that account for these good outcomes" (p. 228). A review of these constructs and their relationship to the adult population with LD provides evidence for possible factors contributing to the persistence of adults with LD across postsecondary educational and employment settings.

Positive Relationships with Caring Adults

Supportive adults or mentors appear to be one of the strongest protective factors for adults with LD (Gerber, Ginsberg, & Reiff, 1992; Spekman et al., 1992; Werner, 1993). The adults with LD interviewed by Reiff, Gerber, and Ginsberg (1997) consistently reported the importance of their "social ecologies" (supportive and helpful people). Caring adults may or may not include parents. However, effective parenting also appears to be a significant protective factor enabling adults with LD to develop strong self-concepts and positive peer relationships (Cosden, Brown, & Elliott, 2002; Reynolds, 1999; Rothman & Cosden, 1995). Interestingly, being the primary caregiver may represent a greater risk for individuals with LD than for nondisabled peers, particularly females. Women with high incidence of dis-

abilities are more likely to become single parents prior to adulthood than females without disabilities (Levine & Nourse, 1998; Trainor, 2007).

Using the Education Longitudinal Study of 2002 (ELS), we examined the influence of risk and resilience factors on adolescents with a high incidence of disabilities (i.e., learning disabilities and behavior disorders) compared to their peers without disabilities (Rojewski, Lee, Gemici, & Gregg, 2011a). No differences were noted across type of disability. The first phase of this research examined the factors for individuals with high incidence of disabilities on pursuit or completion of postsecondary education measured 2 years after high school completion. One group comprised individuals who (1) had successfully completed or were enrolled in 2-year postsecondary education, or (2) were enrolled in a 4-year postsecondary education program. These educational persisters/completers were compared to a second group of individuals who (1) had never enrolled in postsecondary education or (2) had enrolled in a 2- or 4-year program but left before completion. We conducted a series of marginal logit models to select significant covariates for the final model to determine which risk–resilience factors influence college persistence of individuals with high incidence disabilities. In relation to family risk–resilience factors, family composition and parent discussions about college were significant predictors of college persistence. Students who discussed going to college with their parents and lived with both parents were also more likely to go to or persist in college.

For the college population with LD, Reynolds (1999) also found that factors representing strong family support and positive family relations appear to prevent the emergence of an emotional disorder more related to high stress. It appears that for the adult population with LD, support by mentors such as family, friends, school professionals, or work employers significantly increases positive postsecondary outcomes.

Self-Regulation

The research surrounding self-regulated learning and behavior has not received a great deal of recent attention specific to the adult population with LD. However, the limited research that is available suggests that adolescents with LD often do not appear to maximize the skills and knowledge they have learned through effective learning strategies (Lenz & Deshler, 2005). Important academic self-regulation abilities for postsecondary educational success include the ability to manage time, practice, master learning methods, set goals, and demonstrate strong self-efficacy. Looking at a college population with and without LD, Rubin, McCoach, McGuire, and Reis (2003) found that students with LD differ significantly from students without LD in the relationship between their motivation for, and use of standard self-regulated academic learning strategies.

"Self-efficacy beliefs"—an evaluation of one's own specific competence—are also integral to one's ability to self-regulate behavior and learning. Academic, social, and emotional self-efficacy are the three most common beliefs identified by researchers (Bandura, Barbaranelli, Capara, & Pastorelli, 2001). Social and emotional self-efficacy has received less attention from researchers. "Academic self-efficacy," an individual's ability to manage and master academic expectations, is most often reported in the literature. Research provides evidence that many adolescents and adults with LD overestimate their academic competence (Hampton & Mason, 2003; Hoza et al., 2004; Lackaye, Margalit, Ziv, & Zinman, 2006; Rubin et al., 2003; Stone & May, 2002). While overestimating their own performance, adolescents with LD appear to evaluate their academic competence more accurately than do their nondisabled peers (Stone & May, 2002).

Positive Self-Concept

Resilience is strongly influenced by one's positive self-concept, a multifaceted and dynamic critical variable in the effectiveness and consistency of self-regulatory mechanisms (Markus & Wurf, 1987), academic motivation (Pintrich & Schunk, 2002), academic achievement (Byrne, 2002), and depression and anxiety (Prout & Prout, 1996). The follow-along and follow-up LD studies identify positive self-concept to be a protective factor for long-term success

(Goldberg et al., 2003; Raskind, Goldberg, Higgins, & Herman, 1999; Spekman et al., 1992; Werner, 1993).

As individuals view themselves differently across different domains, times in life, and situations, the popular belief that individuals with LD will develop poor self-esteem as a consequence of their learning difficulties has been challenged (Elbaum & Vaughn, 2003; Nelson, in press; Reynolds, 1999). Evidence of the multidimensionality of the construct referred to as "self-concept" has contributed to a better understanding of the outcome differences noted across the literature. The three types of self-concept that are most often investigated in relation to individuals with LD include academic, social, and general self-concept. Unfortunately, the majority of research on the self-concept of adults with LD has been conceptualized from a more unidimensional perspective (Nelson, in press). In addition, many of the adults with LD represented throughout the literature are college students. This is critical to keep in mind, since the majority of adults with LD do not attend college (Wagner et al., 2005). The generalizability of current research findings must be carefully interpreted.

Evidence indicates that when adolescents with LD compare themselves to their nondisabled, higher-ability peers, they score lower on general self-concept scales (Elbaum & Vaughn, 2003; Hager & Vaughn, 1995). Several meta-analyses indicate significant differences between general self-concept of students with LD and that of nondisabled peers (Bear, Minke, & Manning, 2002; Kavale & Forness, 1996; Prout, Marcal, & Marcal, 1992). In a recent meta-analysis, Nelson (2011), investigating the general and domain-specific concepts of transitioning high school and college adults with LD, found that adults with LD reported lower general self-concept than did adults without LD. However, the magnitude of the results across these studies was small ($d = -0.34$). Interestingly, looking at the domain-specific self-concept analysis indicates that differences were greater for academic self-concept ($d = -0.56$) than for social self-concept ($d = -0.32$), and almost nil for physical self-concept ($d = -0.13$).

Thus, not all adults with LD appear to display negative global self-concepts. Neither receiving the diagnosis of LD nor having attended special education classes appears to influence the self-concept of individuals negatively (Lewandowski & Arcangelo, 1994). Many adults with LD compensate for their disabilities and adjust effectively to their limitations and their environments, despite the fact that the disorder does not dissipate with time (Swanson & Hseih, 2009). The adults with LD described in the qualitative interviews by Gerber and Reiff (1991) discussed how they were able to turn their LD into a positive experience. While LD does not cause a poor self-concept, the condition does appear to introduce a risk factor. If these adults are not provided adequate resources, significant stress could result in psychological disorders (Gleckman, 1992; Gregg, 2009b; Reynolds, 1999). In relation to academic success, recent evidence with low-literacy adolescents suggests that self-concept relative to ability predicts both time spent in voluntary reading and achievement in both general and some domain-specific reading tasks even more than time spent in voluntary reading (Moje, Overby, Tysvaer, & Morris, 2008).

Motivation to Be Effective

The influence of an adult's motivation (intrinsic and extrinsic) and engagement in career adjustment plays a significant role for future outcomes. In addition, understanding what specific features of learning and employment environments encourage persistence is critical to providing adequate resources for the adult population with LD. Unfortunately, studies on motivation and adult literacy are scarce (Comings & Soricone, 2007).

The effect of intrinsic and extrinsic rewards or incentives for participation in postsecondary educational or employment settings for individuals with LD has not been thoroughly examined in the literature. Researchers provide evidence that when a student whose motivation is more intrinsic engages more deeply in learning activities (Wigfield & Wentzel, 2007). College students who are more intrinsically motivated appear to demonstrate better outcomes for text recall (Ryan, Connell, & Plant, 1990), student well-being (Levesque, Zuehlke, Stanek, & Ryan, 2004), and grades (Burton,

Lydon, D'Alessandro, & Koestner, 2006). However, the positive influence of extrinsic motivators has been debated (Cameron, Banko, & Pierce, 2001; Deci, Koestner, & Ryan, 1999, 2001). A meta-analysis of 128 studies confirms that extrinsic rewards are not as effective as intrinsic ones (Deci et al., 1999). Yet the debate over the importance of extrinsic rewards in relation to how adults with LD participate in postsecondary educational or career settings needs further investigation. Many state and federally funded literacy programs and postsecondary academic settings do offer incentives (extrinsic rewards) for enrollment. Extrinsic rewards for opportunities such as support for child care, scholarships for enrollment, or replacement of lost wages might lead to a more positive outcome.

"Autonomous motivation" is acting with a sense of volition, choice, concurrence, and willingness. Individual choice appears to yield more effective student performance, as well as better psychological health (Deci, La Guardia, Moller, Scheiner, & Ryan, 2006; Deci et al., 1999). A study by Vallerand and Bissonnette (1992) assessed the autonomous motivation of junior college students at the beginning of the year. At the end of the year, those who stayed in school had been more autonomously motivated than those who dropped out. The role of autonomous motivation in the adult population with LD is an area of research needing greater attention in relation to persistence across postsecondary settings.

The outcomes research based on longitudinal studies investigating the influence of adult learners' motivation to persist in adult literacy programs provides important understanding of the persistence of adults to succeed in learning (Comings, 2009). Researchers found that previous engagement after formal schooling, social support networks, and the identification of personal goals are critical factors that contribute to attaining literacy proficiency. Researchers also provide evidence that learners experience literacy progress if they gain access to knowledgeable and skilled mentors and learning materials designed to support progress (Comings & Scoricone, 2007). Unfortunately, very few randomly designed studies pertain to motivation and self-regulated learning in adolescents or adults (Oyserman, Brickman, & Rhodes, 2007; Oyserman, Bybee, & Terry, 2006). Research specific to strategies and resources that better enhance the motivation of adults with LD, so that the attainment of long-term literacy needs is achieved, remains lacking in the field.

Additional Risk and Resilience Factors

Several factors not identified in the Masten resilience model that are important to consider when examining persistence factors for the adult population with LD include gender, race, ethnic minority and socioeconomic status (SES), comorbidity, academic preparedness (literacy), and support systems (accommodations).

Gender

The influence of gender on the aspirations and attainment of successful career goals is not clear. Females with LD express higher occupational aspirations than their male peers, and are more likely to aspire to either high- or low-prestige occupations (Betz & Fitzgerald, 1987; Rojewski & Yang, 1997). In addition, females tend to restrict their range of potential occupations at an early age and are more likely than males to adjust their narrower educational and occupational expectations downward over time (Rojewski, 1996, 1999). In our recent study using data from the National Education Longitudinal Study of 1988 (NELS:88; National Center for Educational Statistics, 2005), we were surprised to find the influence of gender on the development and trajectory of occupational aspirations. NELS:88 contains nationally representative longitudinal data designed for study of the educational, vocational, and personal development of adolescents and young adults. The database comprises an initial two-stage, stratified cluster sample of approximately 25,000 adolescents attending 1,052 schools nationwide, followed at 2-year intervals since 1988. We expected gender to have a negative influence on occupational aspirations. However, no statistically significant gender differences were detected in this study. While females with LD expressed higher aspirations, they also demonstrated greater score variability than their male counterparts. Because previous research has shown that females with

LD tend to experience poorer occupational outcomes than their male counterparts, the findings from our study suggest a need for greater exploration of the role gender plays in relation to career aspiration and attainment (Wagner et al., 2005).

Ethnic and Racial Minorities

Ethnicity and race have a significant impact on career development, choice, and attainment. However, the collinearity between race and SES makes it difficult to understand their influence on career attainment (Mau & Bikos, 2001; Mpofu & Harley, 2006; Worthington, Flores, & Navarro, 2005). Despite the paucity of information about connections among race/ethnicity, disability, and career development, some information does exist. It is estimated that 2.6 million new students in higher education will be ethnic minorities, with Hispanics being the largest group (Bragg, Kim, & Barnett, 2006; Carnevale & Fry, 2000; Laanan, 2006). The enrollment and retention rates of minorities still lag behind those of their nonminority peers (Green, 2006). African American and Hispanic students with LD are less likely to have access to postsecondary learning environments (Phelps & Hanley-Maxwell, 1997; Wagner et al., 2005). In addition, academic performance measures provide evidence that white students with LD score significantly higher than their peers with LD who are black or Hispanic (Wagner et al., 2005). It does appear that race and ethnicity are potent factors in limiting career options as individuals persist in either postsecondary educational or employment opportunities (Gregg, 2009b; Lee & Rojewski, 2009).

Socioeconomic Status

The risk that SES presents to successful postsecondary outcomes is a critical factor requiring more in-depth exploration by researchers (Gregg, 2007). SES has been identified as a significant predictor of occupational aspirations and postsecondary persistence (Rojewski & Kim, 2003): Postsecondary career attainment is highly correlated with "systematic patterns of educational placement and social expectations that remain indirectly a function of SES" (p. 106). Youth with LD from low-income households perform less well academically than their peers with or without disabilities regardless of their race/ethnicity (Rojewski & Kim, 2003). Wagner and colleagues (2005) report that students with LD from households with low incomes score significantly lower on achievement measures than youth from moderate-income households.

However, in the NELS:88 study reviewed previously in this chapter, we found that rather than present consistent effects on occupational aspirations SES varied depending on whether we considered aspirations at separate data points or the trajectory of aspirations over time (Rojewski, Lee, Gregg, & Gemici, 2012). These findings are directly opposite of those reported from a nondisabled sample taken from the same database (Lee & Rojewski, 2009). It is possible that support services offered through special education during early school grades may provide some type of moderating effect on influences of SES on occupational aspirations for adolescents with LD. Special education services might reduce the negative effects of SES on the development of career aspirations. This interesting question needs to be pursued in future research.

Yet, in another recent study discussed in this chapter (Rojewski et al., 2011a), we investigated the influence of factors on intermediate postsecondary educational outcomes of adolescents with high-incidence disabilities (LD as well as behavioral disorders). We found grade point average (GPA), SES, family composition, and parental discussion of college to be significant predictors of college persistence. Students with higher SES and GPA were more likely to go to or persist in college. Since past studies of individuals with LD (Rojewski, 1996, 1999) and nondisabled samples (Lee & Rojewski, 2009; Rojewski & Yang, 1997) have shown SES to have an early and persistent influence on career development, further study should examine the role of SES for adolescents and adults with LD.

Certainly, the literature indicates that SES provides a context for the development of occupational choices (Rojewski & Gregg, 2011; Schoon & Parsons, 2002). The greater an individual's SES, the greater access to postsecondary education, special learning experiences, and opportunities to interact

with role models in high-prestige occupations (Rojewski & Kim, 2003).

Comorbidity

The diagnosis of LD appears to place an individual at a greater risk for other, coexisting psychiatric and/or developmental disorders (Angold, Costello, & Erkanli, 1999). The most frequently occurring comorbid disorders in adults with LD include individuals with one or more of the following: generalized anxiety disorders (GAD), depression, and attention-deficit/hyperactivity disorder (ADHD) (Gregg, 2009b).

Associations between mental health problems and academic difficulties suggest that adults with LD may be at particular risk for developing problems with depression and anxiety. Recent meta-analyses indicate that children with LD, relative to their peers without LD, experience more depressive (Maag & Reid, 2006) and anxious symptomatology (Nelson & Harwood, 2010). The prevalence of GAD in the adult population with LD is best understood by reviewing the epidemiological longitudinal data collected through the National Collaborative Perinatal Project (NCPP; Marin et al., 2007). The NCPP reviewed the data from over 50,000 pregnancies in 12 cities across the United States between 1959 and 1966. They found that participants with LD were almost twice as likely to meet lifetime criteria for GAD as their nondisabled peers. The results also indicated that a 15-point advantage in cognitive ability was associated with a 50% reduced risk of lifetime GAD, and 89% and 57% reduction in risk of GAD in childhood and adolescence across both groups, respectively.

Very little research is available examining the relationship between LD and depression for the adult population (Gregg, 2009b). Only five studies of depression and anxiety could be found, and all were limited to the college population with LD (Carroll & Iles, 2006; Hoy et al., 1997; Mattek & Wierzbicki, 1998; Riddick, Sterling, Farmer, & Morgan, 1999). Mixed results were found across these studies. Nelson and Gregg (2012) compared depressive and anxious symptomatology in college students with ADHD, dyslexia, and comorbid ADHD–dyslexia and a nondisabled population. In addition, they compared students with these disorders making the transition from high school to college. No differences were found between the college-level groups, although a main effect was found toward females with dyslexia reporting more symptoms of depression and anxiety than did males with dyslexia.

Attention-Deficit/Hyperactivity Disorder

Incidence figures of adults demonstrating both LD and ADHD are difficult to find despite the clinical observations and suggestions by professionals (Gregg, 2009b). When rigorous eligibility criteria are applied, then approximately 8–39% of children with ADHD demonstrated LD, and 12–27% demonstrated ADHD and LD impacting math learning (Barkley, 2006; Semrud-Clikeman et al., 1992; Semrud-Clikeman, Guy, Griffin, & Hynd, 2000). Murphy, Barkley, and Bush (2002) found a greater incidence of learning disorders among adults with predominantly inattentive type ADHD compared to adults with no disabilities.

Given the incidence of mood disorders with the population demonstrating either ADHD or LD, the possibility of anxiety and/or depression to co-occur with these adults is high. However, Nelson and Gregg (2012) found that internalizing symptomatology differences were not found for subtypes of ADHD. These findings contrasted those of the largest epidemiological study of adult ADHD to date, the National Comorbidity Survey Replication (Kessler et al., 2006), and other studies (Biederman et al., 2004, 2008). Methodological differences between these studies and the Nelson and Gregg (2012) prevent direct comparison of the studies. Again, such findings suggest that college populations are a unique subpopulation within the larger population of adults (Nelson & Gregg, 2012). Interestingly, they also found that transitioning high school students with ADHD, dyslexia, or ADHD–dyslexia reported fewer symptoms of anxiety and depression than did college underclassmates with these disorders.

Academic Preparedness (Literacy)

Minimal participation by adults with LD in postsecondary education institutions and/or

employment settings appears to be significantly correlated to their poor achievement performance. According to the most recent national survey of adult literacy, more than 90 million U.S. adults are estimated to lack adequate literacy (Kutner et al., 2007). Given the incidence figures of the adult population with documented LD (i.e., strict eligibility criteria) ranging from 3 to 5%, a significant number of adults with LD appear to lack the print or digital media skills required for persistence in postsecondary settings (Gregg, 2011).

Investigating the national longitudinal database, Rojewski and Kim (2003) found that occupational aspirations are influenced more by academic achievement than by almost any other variable. The risk factor of academic preparedness for postsecondary education is startling when one considers data from the NLTS-2, which revealed that over 50% of secondary students with LD performed below the 16th percentile on reading comprehension measures. According to several researchers, ineffective secondary curricula, poverty, and lack of student–adult connections have been identified as significant contributors to such dismal outcomes (Gregg, 2011; Morocco, Aguilar, Clay, Brigham, & Zigmond, 2006). Not surprisingly, the high school dropout rate for adolescents with LD is two to three times more than that of their peers (U.S. General Accounting Office, 2003; Young & Brown, 2005). The adult population with LD is also 20–60% more likely to access welfare programs (Burgstahler, 2003; Young & Brown, 2005), and serve time in correctional institutions (Burrell & Warboys, 2000; Christle, Jolivette, & Nelson, 2000; Stenhjem, 2005).

Support Systems (Accommodations)

Accommodating adults with LD is common practice across postsecondary educational and employment settings. Unfortunately, empirically based studies documenting the effectiveness of accommodations on adult outcomes are underrepresented in the literature. This is particularly evident related to employment settings. In an extensive review of the literature, Gregg (2009a) found no empirically based studies in which work accommodations specific to the adult population with LD were even investigated. She found that the effectiveness of instructional accommodations was represented by only seven reading studies, 10 writing studies, and one mathematics study. While testing accommodation research predominates in the literature, Gregg identified only 31 studies specific to the adolescent and/or adult population with LD. Of these 31 studies, 57% were specific to postsecondary entrance exams. Again, as we consider the persistence of the adult population in either academic or career settings, the postsecondary college population that is most often reported in the literature does not represent the heterogeneity of the adult population with LD.

The accommodation studied most often among the adolescent and adult populations with LD is extended time. Gregg and Nelson (2010) used a meta-analysis to compare scores of adolescents and adults with and without LD on accommodated tests. Again, the literature is lacking in quantity of studies, restricted in types of design methodologies, and underrepresentative of the diversity of individuals demonstrating the disorder. After a thorough review of the literature, they found that only nine studies in which adequate empirical data were available to include in their meta-analysis. One of the most distressing findings of the meta-analysis was that transitioning secondary students with LD still underperform compared to their normally achieving peers, whether provided extended time or not on standardized tests. As noted by Cohen, Gregg, and Deng (2005), "Accommodations are not the source of differential performance, in other words, they simply mediate learning" (p. 233).

The lack of empirically based research to document the effectiveness of specific technologies, new media, and assistive technologies for accommodating the requirements facing the adult population with LD limits their career options (Gregg, 2009a). Our global workforce requires all adults to think critically and creatively (Silva, 2008), to develop literacies skills (e.g., selecting, analyzing, evaluating, synthesizing, and sharing information) in conjunction with information and communication technologies (ICT) (Organisation for Economic Co-operation and Development, 2010), to make and apply knowledge flexibly (Partnership for 21st Century Skills, 2009), and to communicate

effectively with diverse others (North Central Regional Education Laboratory, 2003). This requires professionals with LD to utilize literacy strategies and accommodations for proficiency with online learning, using multimodal texts and environments. At this time, we do not have research that maps the competencies and configurations of competencies involved in literacy online and the specific multimodel text effective with adult learners demonstrating LD.

Future Directions

Adults with LD remain underserved and underprepared for facing the demands of the 21st century's increasingly networked, mobile, globally interconnected world that puts a premium on literacy proficiency. The majority of these individuals do not complete a secondary curriculum with rigorous academic requirements. They have little familiarity with the exigencies of the workplace, lack persistence to attend or complete college degrees, and demonstrate impaired judgment about attainable career goals and career maturity (Gregg, 2007; Rojewski, 1996; Wagner et al., 2005). Current research that examines the critical factors contributing to the persistence of adults with LD at postsecondary educational institutions and employment settings is based primarily on participants attending 4-year colleges or universities. Therefore, the literature does not represent the heterogeneity of the population, limiting the generalizability of research findings. Greater advances in the recognition of factors influencing the persistence of adults with LD will be achieved when we better understand the interaction of individual, social, cultural, and systemic influences (Pintrich, 2003). As one reviews the literature throughout this chapter, three areas of study stand out as critical for increasing our understanding of the adult population with LD. These areas include the investigation of persistence using multidimensional models, effective studies that focus on ICTs, and attention to career development models.

Multiple Dimensions of Persistence

It is easy to underestimate and undervalue the significant efforts needed for an adult with LD to persist in academic and work settings. The importance of better understanding the multiple dimensions surrounding persistence is critical for improving educational and employment outcomes. The literature in the field of LD has addressed persistence primarily in psychological terms (e.g., self-regulation, self-concept, goals, intrinsic motivation). The risk and resilience studies earlier in this chapter focus on reviews of the psychological factors influencing persistence. Contemporary motivation researchers recognize the importance of the learner's environment, relationships, and broader social and cultural experiences that affect persistence (Anderman & Anderman, 2010). For instance, Cara and Litster (2009) stress the importance of considering engagement (context, texts, and tasks) and systemic factors that are equally essential for a better understanding of persistence.

Many adults with LD are less motivated to engage in literacy tasks as a result of their difficulties with the demands of reading and writing (Graham & Perin, 2007; Guthrie & Wigfield, 2000; Vrugt, Oort, & Zeeberg, 2002). Providing adult readers more opportunities to choose text that connects with or expands their interests is critical for retaining engagement (Guthrie & Wigfield, 2000; Moje et al., 2008). More research focus on ways to inspire adults' persistence, even when faced with challenging reading tasks or lack of background knowledge, is a critical need (Padak & Baradine, 2004). Use of well-written texts, new media, graphics that incorporate vivid imagery, and networking of ideas are just some of the ideas professionals might consider to help adults with LD who struggle to persist with literacy tasks (Schraw & Lehman, 2001; Wade, Buxton, & Kelly, 1999). It is important that researchers have a better idea of how text and tasks used by adults in academic or employment settings affect motivation to persist despite cognitive and linguistic processing deficits (Gregg, 2009b; Guthrie & McCann, 1997). In addition, there is a need for a better understanding of how technologies and assistive technologies commonly used by adults with LD continue to motivate persistence, and how they are introduced and supported.

The impact of systems and structures faced by adults in their personal, school, or work worlds is highly relevant because these

environmental mediators influence persistence to succeed (Moll & Diaz, 1993). Adults with LD engage in literacy across multiple domains, with a range of environments, and for multiple purposes (Alvermann & Xu, 2003; Blackburn, 2005; Cowan, 2004; Fisher, 2007; Jocson, 2008; Lewis & Fabos, 2005; Moje et al., 2008; Morrell & Duncan-Andrade, 2003). Researchers who investigate the motivating factors that influence persistence to learn will be informed by research pertaining to out-of-school learning practices. Many adults with LD remind us that successful literacy practice in a school context may be considered ineffective in other environments (e.g., at work). Moje and Luke (2009) note that adolescents with reading difficulties often diminish the value of the various kinds of reading they do on a regular basis, perceiving it not to count as reading and therefore failing to see themselves as readers.

Researchers investigating community-based and afterschool practices for media-intensive and arts-based instruction provide evidence of the positive aspects of this learning that might be important for the adult population with LD (e.g., Buckingham, 2003; Eccles & Gootman, 2002; Soep & Chavez, 2005). Researchers who have compared individuals who participate in these programs with their nonaffiliated peers suggest superior academic and social performance (Hull, Kenney, Marple, & Forsman-Schneider, 2006). From a persistence perspective, these alternative educational spaces provide a reentry point for many adolescents and adults with LD to reengage with learning.

Information and Communication Technologies

The digital, multinetwork, multitasking world of information and communication is redefining literacy in the 21st century (New Literacies Research Team, 2007). With the increasing importance of technology in academic and work environments, more research is needed to understand the similarities and differences between the demands of offline reading (traditional reading practices), online (Internet), and other digital learning formats (e.g., e-Text) for the adult learner with LD. Evidence suggests that there is often very little correlation between offline and online reading proficiency for students with or without disabilities (Coiro & Dobler, 2007; Leu & Reinking, 2005; Zhang & Duke, 2008).

Research primarily conducted with proficient youth (Coiro & Dobler, 2007) and proficient adults (Miller, Stine-Morrow, Kirkorian, & Conroy, 2004; Zhang & Duke, 2008) has identified several processes critical to online reading. These include use of prior knowledge (Cromley & Azevedo, 2009); inferential reasoning strategies, particularly forward inferencing (Coiro & Dobler, 2007); comprehension monitoring (Attar, 2005; Bilal & Kirby, 2002); and self-regulation (Coiro & Dobler, 2007; Zhang & Duke, 2008). Because these processes have been difficult for adults with LD using traditional text, the influences of these cognitive processes for online learning need further study (Gregg, 2009b). Motivation and disposition appear to be critical affective factors influencing online reading and writing in adult populations without LD (Attar, 2005; Smith, 2010; van den Broek, Verschelden, & Boonaert, 2008). The generalization of this to the adult population with LD also needs more attention in the literature.

Reading and writing online is one of many ICTs available to adult learners. Graesser and King (2008) identified 10 classes of technologies: computer-based training; multimedia; interactive simulations; hypertext and hypermedia; intelligent tutoring systems; inquiry-based information retrieval; animated pedagogical agents; virtual environments; games; and computer-supported collaborative learning. Research on adults with LD is needed to better understand the effectiveness of these different types of ICTs with LD subgroups. Computerized learning environments are available that focus on the development of reading and writing skills, but little has been done with the adult population (McNamara, 2007). On the increase are technologies that provide adult learners tools to support higher levels of literacy learning. In addition, with the access of mobile technologies (e.g., phone), many adolescents and adults acquire facility with digital tools that require reading and writing in their out-of-school lives.

Virtual worlds provide a means by which an increasing number of adults with LD can

access knowledge, supports, and interventions, in both their academic and employment settings. Evidence indicates that people quickly identify with their avatars and transfer positive experiences to them (Bailenson & Fox, 2009), increasing motivation, engagement, self-efficacy, and social skills (Holden, Bearison, Rode, Rosenberg, & Fishman, 1999; Kizelshteyn, 2008). Electronic mentoring located in virtual environments provides great potential for adult populations across multiple literacy domains and environments (e.g., learning, employment). A mentoring island might be developed to provide accommodation resources for adolescents or adults with LD. It would provide a realistic way for busy adults with LD to receive guidance on accommodations, to cope with their disability issues, to navigate transition points, to locate and use school or work resources, to build meaningful relationships, and to engage in communication with key stakeholders.

Other social media (Twitter, Facebook, etc.) provide additional opportunities for adults with LD to access information and resources, such as accommodations, while developing literacy skills. Researchers have begun to design and implement social networking sites specifically to encourage literacy-rich educational activities, such as multimodel composing, language learning, and intercultural understanding (e.g., Hull, Stornaiuolo, & Sahni, 2010).

Career Development Models

Little attention has been directed toward the career development needs of adults with LD, particularly the workbound population. Much of the hesitation results from commonly held assumptions about the career development process (Rojewski & Gregg, 2011). The career behaviors of adolescents and adults with LD are largely unsystematic and influenced by chance (Gregg, 2009b). Several risk factors appear to influence the success of the adult population with LD, including social stigma (Stone, Stone, & Dipboye, 1992), employment discrimination (Unger, 2001), and inadequate academic and vocational training (Ochs & Roessler, 2001). Career models inclusive of the unique aspects of career behaviors, including occupational and educational aspirations for adults with LD, need to be compared to the behavior, susceptibility to career choice risks, and outcomes of adults without LD.

Career aspirations and outcomes for the adult population with LD are closely aligned with adult literacy proficiency, since literacy exerts a significant influence on economic indicators. We know that as much as 55% of long-term differences in the growth rate of the gross domestic product (GDP) per capita and productivity growth at the national and international levels is influenced by the adult literacy rates of a country (Murray et al., 2009). Adults with higher literacy skills work more, experience less unemployment, earn more, spend less time unemployed, and rely less on government support (Green & Riddell, 2007; Osberg, 2000). Also, there is a high correlation between literacy and adult health, including the probability of illness, length of recovery, and age at death (Kutner, Greenberg, Jin, & Paulsen, 2006; Murray et al., 2009; Rudd, Kirsch, & Yamoto, 2004). Because literacy proficiency highly correlates to the social and economic growth of a country, providing evidence-based literacy accommodations and interventions for the adult population with LD is critical.

Adults with LD represent a heterogeneous population in terms of ability, experience, support systems, learning context, and work environments. Their motivation and engagement with learning persistence has for the most part been excluded in the literature. Critical to future research will be a focus on identifying the barriers to persistence, so that sustained educational and employment resources can provide greater access and positive outcomes for the adult population with LD.

REFERENCES

Alvermann, D. E., & Xu, S. H. (2003). Children's everyday literacies: Intersections of popular culture and language arts instruction. *Language Arts, 81*(2), 145–155.

Anderman, E. M., & Anderman, L. H. (2010). *Classroom motivation.* Upper Saddle River, NJ: Pearson.

Anderman, L. H., & Anderman, E. M. (Eds.). (2006). Considering contexts in educational psychology: Introduction to the special issue. *Educational Psychologist, 35*(2), 67–68.

Angold, A., Costello, E. J., & Erkanli, A. (1999).

Comorbidity. *Journal of Child Psychiatry, 40*(1), 57–87.

Attar, D. (2005). Dismay and disappointment: Perspectives of inexperienced adult learners on becoming webpage readers. *International Journal of Educational Research, 43*, 495–508.

Bailenson, J. N., & Fox, J. (2009). Virtual self-modeling: The effects of vicarious reinforcement and identification on exercise behaviors. *Media Psychology, 12*, 1–25.

Bandura, A., Barbaranelli, C., Capara, G. V., & Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and career trajectories. *Child Development, 72*, 187–206.

Barkley, R. A. (2006). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (3rd ed.). New York: Guilford Press.

Bear, G. G., Minke, K. M., Griffin, S. M., & Deemer, S. A. (1998). Achievement related perceptions of children with learning disabilities and normal achievement: Group and developmental differences. *Journal of Learning Disabilities, 31*, 91–104.

Bear, G. G., Minke, K. M., & Manning, M. (2002). Self-concept among children with LD: A meta-analysis. *School Psychology Review, 31*, 405–427.

Betz, N. E., & Fitzgerald, L. (1987). *The career psychology of women.* Orlando, FL: Academic Press.

Biederman, J., Ball, S. W., Monuteaux, M. C., Mick, E., Spencer, T. J., McCreary, M., et al. (2008). New insights into the comorbidity between ADHD and major depression in adolescent and young adult females. *Journal of the American Academy of Child and Adolescent Psychiatry, 47*, 426–434.

Biederman, J., Faraone, S. V., Monuteaux, M. C., Spender, T., Wilens, T., Bober, M., et al. (2004). Gender effects on attention-deficit/hyperactivity disorder in adults, revisited. *Biological Psychiatry, 55*, 692–700.

Bilal, D., & Kirby, J. (2002). Differences and similarities in information seeking: Children and adults as Web users. *Information Processing and Management, 38*, 649–670.

Blackburn, M. V. (2005). Agency in borderland discourses: Examining language use in a community center with Black queer youth. *Teachers College Record, 107*(1), 89–113.

Bragg, D. D., Kim, E., & Barnett, E. A. (2006). Creating access and success: Academic pathways reaching underserved students. In D. D. Bragg & E. A. Barnett (Eds.), *Academic pathways to and from the community college* (pp. 5–20). San Francisco: Jossey-Bass.

Buckingham, D. (2003). *Media education: Literacy, learning, and culture.* Cambridge, UK: Polity Press.

Burgstahler, S. (2003). DO-IT: Helping students with disabilities transition to college and careers (National Center on Secondary Education and Transition). Retrieved March 28, 2007, from *www.ncset.org/publications/viewdesc.asp?id=1168.*

Burrell, S., & Warboys, L. (2000, July). Special education and the juvenile justice system. Washington, DC: Office of Juvenile Justice and Delinquency Prevention. Retrieved January 7, 2007, from *www.ncjrs.org/html/ojjdp/2000_6_5/contents.html.*

Burton, K., Lydon, J., D'Allessandro, D., & Koestner, R. (2006). The differential effects of intrinsic and identified motivation on well-being and performance: Prospective, experimental, and implicit approaches to self-determination theory. *Journal of Personality and Social Psychology, 91*, 750–762.

Byrne, B. M. (2002). Validating measurement and structure of self-concept: Snapshots of past, present, and future research. *American Psychologist, 57*, 897–909.

Cameron, J., Banko, K. M., & Pierce, W. D. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *Behavior Analyst, 24*(1), 1–44.

Cara, O., & Litster, J. H. (2009). Teacher attitudes toward the "skills for life" national strategy for improving adult literacy and numeracy skills. In S. Reder & J. Bynner (Eds.), *Tracking adult literacy and numeracy skills: Findings from longitudinal research* (pp. 177–199). New York: Routledge.

Carnevale, A. P., & Fry, R. A. (2000). *Crossing the great divide: Can we achieve equity when generation Y goes to college?* Princeton, NJ: Educational Testing Service.

Carroll, J. M., & Iles, J. E. (2006). An assessment of anxiety levels in dyslexic students in higher education. *British Journal of Educational Psychology, 76*, 651–662.

Christle, C. A., Jolivette, K., & Nelson, C. M. (2000). Youth aggression and violence: Risk, resilience, and prevention. Arlington, VA: ERIC Clearinghouse on Disabilities and Gifted Education. Retrieved January 16, 2006, from *http://ericec.org/digests/e602.html.*

Chronicle of Higher Education. (2007). Almanac of Higher Education 2012: Students. Retrieved September 26, 2012, from *http://chronicle.com/article/Almanac-2012-Students/133763/?f-nav.*

Cohen, A., Gregg, N., & Deng, M. (2005). The role of extended time and item content on a high-stakes mathematics test. *Journal of Learning Disabilities Research and Practice, 20*, 225–233.

Coiro, J., & Dobler, E. (2007). Exploring the online comprehension strategies used by sixth-grade

skilled readers to search for and locate information on the Internet. *Reading Research Quarterly, 42*(2), 214–257.

Comings, J. (2009). Student persistence in adult literacy and numeracy programs. In S. Reder & J. Bynner (Eds.), *Tracking adult literacy and numeracy skills: Findings from longitudinal research* (pp. 160–176). New York/London: Routledge.

Comings, J., & Soricone, L. (2007). *Adult literacy research: Opportunities and challenges* (Occasional Paper of the National Center for the Study of Adult Learning and Literacy). Cambridge, MA: Harvard Graduate School of Education.

Cosden, M., Brown, C., & Elliott, K. (2002). Development of self-understanding and self-esteem in children and adults with learning disabilities. In B. Y. L. Wong & M. Donahue (Eds.), *Social dimensions of learning disabilities* (pp. 33–51). Mahwah, NJ: Erlbaum.

Cowan, P. (2004). Devils or angels: Literacy and discourse in lowrider culture. In J. Mahiri (Ed.), *What they don't learn in school: Literacy in the lives of urban youth* (pp. 47–74). New York: Peter Lang.

Cromley, J. G., & Azevedo, R. (2009). Locating information with extended hypermedia. *Educational Technology Research and Development, 57*(3), 287–313.

DaDeppo, L. M. W. (2009). Integration factors related to the academic success and intent to persist of college students with learning disabilities. *Learning Disabilities Research and Practice, 24*(3), 122–131.

Day, J. C., & Newburger, E. C. (2002). The big payoff: Educational attainment and synthetic estimates of work–life earnings. Washington, DC: U.S. Census Bureau. Retrieved from *www.census.gov/prod/2002pubs/p23-21pdf.*

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). The undermining effect is a reality after all—extrinsic rewards, task interest, and self-determination: Reply to Eisenberger, Pierce, and Cameron (1999) and Lepper, Henderlong, and Gingras (1999). *Psychological Bulletin, 125*(6), 692–700.

Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic rewards and intrinsic motivation in education reconsidered once again. *Review of Educational Research, 71*, 1–27.

Deci, E. L., La Guardia, J. G., Moller, A. C., Scheiner, M. J., & Ryan, R. M. (2006). On the benefits of giving as well as receiving autonomy support: Mutuality in close friendships. *Personality and Social Psychology Bulletin, 32*, 313–327.

Eccles, J., & Gootman, J. (Eds.). (2002). *Community programs to promote youth development.* Washington, DC: National Academic Press.

Elbaum, B., & Vaughn, S. (2003). Self-concept and students with learning disabilities. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 229–241). New York: Guilford Press.

Fisher, M. J. (2007). *Writing in rhythm: Spoken word poetry in urban classrooms.* New York: Teachers College Press.

Gerber, P. J., Ginsberg, R., & Reiff, H. B. (1992). Identifying alterable patterns in employment success for highly successful adults with learning disabilities. *Journal of Learning Disabilities, 25*, 475–487.

Gerber, P. J., & Reiff, H. B. (1991). *Speaking for themselves: Ethnographic interviews with adults with learning disabilities.* Ann Arbor: University of Michigan Press.

Getzel, E. E. (2008). Addressing the persistence and retention of students with disabilities in higher education: Incorporating key strategies and supports on campus. *Exceptionality, 16*, 207–219.

Gleckman, A. (1992). A psychological profile of the learning-disabled college student: A cluster analytic assessment as depicted by the MMPI-2. (Doctoral dissertation, Ball State University). *Dissertation and Theses: Full Text Database*, Publication No. 923677.

Goldberg, R. J., Higgins, E. L., Raskind, M. H., & Herman, K. L. (2003). Predictors of success in individuals with learning disabilities: A qualitative analysis of a 20-year longitudinal study. *Learning Disabilities Research and Practice, 18*, 222–236.

Graesser, A. C., & King, B. (2008).Technology-based training. In J. J. Blascovich & C. H. Hartel (Eds.), *Human behavior in military contexts* (pp. 127–149). Washington, DC: National Academy of Sciences.

Graham, S., & Perin, D. (2007). What we know, what we still need to know: Teaching adolescents to write. *Scientific Studies of Reading, 11*, 313–335.

Green, D. (2006). Historically underserved students: What we know, what we still need to know. In D. D. Bragg & E. A. Barnett (Eds.), *Academic pathways to and from the community college* (pp. 21–28). San Francisco: Jossey-Bass.

Green, D. A., & Riddell, C. (2007). *Literacy and the labor market: The generation of literacy and its impact on earning and statistics.* Ottawa: Human Resources and Skills Development Canada.

Gregg, N. (2007). Underserved and underprepared: Postsecondary learning disabilities. *Learning Disabilities Research and Practice, 22*(4), 219–228.

Gregg, N. (2009a). Accommodations: Evidence-based accommodation research specific to the adolescent and adult populations with learning disabilities. In J. M. Taymans (Ed.), *Learning to achieve: A review of the research literature on serving adults with learning disabilities* (pp. 119–182). Washington, DC: National Institute for Literacy.

Gregg, N. (2009b). *Adolescents and adults with learning disabilities and ADHD: Assessment and accommodation*. New York: Guilford Press.

Gregg, N. (Ed.). (2011). *Adolescents and adults with learning disabilities and ADHD*. New York: Guilford Press.

Gregg, N., & Nelson, J. (2010). A meta-analysis of the test accommodation research specific to adolescents and adults with LD. *Journal of Learning Disabilities, 43*, 483–499.

Guthrie, J. T., & McCann, A. D. (1997). Characteristics of classrooms that promote motivations and strategies for learning. In J. T. Guthrie & A. Wigfield (Eds.), *Reading engagement: Motivating readers through integrated instruction* (pp. 128–14). Newark, DE: International Reading Association.

Guthrie, J. T., & Wigfield, A. (2000).Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. III, pp. 403–422). New York: Erlbaum.

Hager, D., & Vaughn, S. (1995). Parent, teacher, peer, and self-reports of the social competence of students with learning disabilities. *Journal of Learning Disabilities, 28*(4), 205–215.

Hampton, N. Z., & Mason, E. (2003). Learning disabilities, gender, sources of efficacy, self-efficacy beliefs, and academic achievement in high school students, *Journal of School Psychology, 41*(2), 101–112.

Holden, G., Bearison, D. J., Rode, D. C., Rosenberg, G., & Fishman, M. (1999). Evaluating the effects of a virtual environment (STARBRIGHT World) with hospitalized children. *Research on Social Work Practice, 9*, 365–382.

Hoy, C., Gregg, N., Wisenbaker, J., Manglitz, E., King, M., & Moreland, C. (1997). Depression and anxiety in two groups of adults with learning disabilities. *Learning Disability Quarterly, 20*, 280–291.

Hoza, B., Gerdes, A. C., Hinshaw, S. P., Arnold, L. E., Pelham, W. E., Molina, B. S., et al. (2004). Self-perceptions of competence in children with ADHD and comparison children. *Journal of Consulting and Clinical Psychology, 72*, 382–391.

Hull, G., Kenney, N., Marple, S., & Forsman-Schneider, A. (2006). *Many versions of masculine: Explorations of boys' identity formation through multimodal composing in an after-school program* (The Robert F. Bowne Foundation's Occasional Papers Series). New York: Robert F. Bowne Foundation.

Hull, G., Stornaiuolo, A., & Sahni, U. (2010). Cultural citizenship and cosmopolitan practice: Global youth communicate online. *English Education, 42*(4), 331–367.

Jessor, R., Van Den Bos, J., Vanderryn, J., Costa, F. M., & Turbin, M. S. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. *Developmental Psychopathology, 31*, 923–933.

Jocson, K. M. (2008). *Youth poets: Empowering literacies in and out of schools*. New York: Peter Lang.

Kavale, K. A., & Forness, S. R. (1996). Social skill deficits and learning disabilities: A meta-analysis. *Journal of Learning Disabilities, 29*, 226–237.

Kessler, R. C., Adler, L., Barkley, R., Biederman, J., Conners, C. K., Demler, O., et al. (2006). The prevalence and correlates of adult ADHD in the United States: Results from the National Comorbidity Survey Replication. *American Journal of Psychiatry, 163*, 716–723.

Kizelshteyn, M. (2008). Therapy and the metaverse. *Washington University Undergraduate Research Digest, 4*, 17–26. Retrieved from *www.turtlethink.com/wuurd%202008_kizelshteyn.pdf.*

Kutner, M., Greenberg, E., Jin, Y., Boyle, B., Hsu, Y., & Dunleavy, E. (2007). Literacy in everyday life: Results from the 2003 National Assessment of Adult Literacy (NCES 2007-480, U.S. Department of Education). Washington, DC: National Center for Education Statistics. Retrieved December 10, 2010, from *http://nces.ed.gov/pubs2007/2007480.pdf.*

Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). The health literacy of American adults: Results from the 2003 National Assessment of Adult Literacy. (NCES 2006-483, U.S. Department of Education). Washington, DC: National Center for Education Statistics. Retrieved November 28, 2008, from *http://nces.ed.gov/pubs2007/2007480.pdf.*

Laanan, F. S. (2006). Editor's notes. In F. S. Laanan (Ed.), *Understanding students in transition: Trends and issues* (pp. 1–5). San Francisco: Jossey-Bass.

Lackaye, T., Margalit, Z., Ziv, O., & Zinman, T. (2006). Comparisons of self-efficacy, mood, effort, and hope between students with learning disabilities and their non-LD-matched peers. *Learning Disabilities Research and Practice, 21*(2), 111–121.

Lee, I., & Rojewski, J. W. (2009). Development of occupational aspiration prestige: A piecewise

latent growth model of selected influences. *Journal of Vocational Behavior, 75*, 82–90.

Lenz, B. K., & Deshler, D. D. (2005). Adolescents with learning disabilities: Revisiting the educators' enigma. In B. V. L. Wong (Ed.), *Learning about learning disabilities* (3rd ed., pp. 535–564). San Diego, CA: Academic Press.

Leu, D. J., & Reinking, D. (2005). Developing Internet comprehension strategies among adolescent students at risk to become dropouts (U.S. Department of Education Institute of Education Sciences Research Grant). Retrieved September 15, 2007, from *www.newliteracies.uconn.edu/ies.html.*

Levesque, C. S., Zuehlke, N., Stanek, L., & Ryan, R. M. (2004). Autonomy and competence in German and U.S. university students: A comparative study based on self-determination theory. *Journal of Educational Psychology, 96*, 68–84.

Levine, P., & Nourse, S. W. (1998). What follow-up studies say about postschool life for young men and women with learning disabilities: A critical look at the literature. *Journal of Learning Disabilities, 31*, 212–233.

Lewandowski, L., & Arcangelo, K. (1994). The social adjustment and self-concept of adults with learning disabilities. *Journal of Learning Disabilities, 9*, 598–605.

Lewis, C., & Fabos, B. (2005). Instant messaging, literacies, and social identities. *Reading Research Quarterly, 40*, 470–501.

Maag, J. W., & Reid, R. (2006). Depression among students with learning disabilities: Assessing the risk. *Journal of Learning Disabilities, 39*, 3–10.

Marin, L. T., Kubzansky, L. D., LeWinn, K. Z., Lipsitt, L. P., Satz, P., & Buka, S. L. (2007). Childhood cognitive performance and risk of generalized anxiety disorder. *International Journal of Epidemiology, 1*, 1–7.

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology, 38*, 299–337.

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 48*, 227–238.

Mattek, P. W., & Wierzbicki, M. (1998). Cognitive and behavioral correlates of depression in learning-disabled and non-learning-disabled adult students. *Journal of Clinical Psychology, 54*, 831–837.

Mau, W. C., & Bikos, L. H. (2001). Educational and vocational aspirations of minority female students: A longitudinal study. *Journal of Counseling and Development, 78*, 186–194.

McNamara, D. S. (Ed.). (2007). *Reading comprehension strategies: Theories, interventions, and technologies.* Mahwah, NJ: Erlbaum.

Miller, L. M. S., Stine-Morrow, E. A. L., Kirkorian, H., & Conroy, M. (2004). Adult age differences in knowledge-driven reading. *Journal of Educational Psychology, 96*, 811–821.

Moje, E. B., & Luke, A. (2009). Literacy and identity: Examining the metaphors in history and contemporary research. *Reading Research Quarterly, 44*, 415–437.

Moje, E. B., Overby, M., Tysvaer, N., & Morris, K. (2008). The complex world of adolescent literacy: Myths, motivations, and mysteries. *Harvard Educational Review, 78*, 107–154.

Moll, L. C., & Diaz, S. (1993). Change as the goal of educational research. In E. Jacob & C. Jordan (Eds.), *Minority education: Anthropological perspectives* (pp. 67–79). Norwood, NJ: Ablex.

Morocco, C. C., Aguilar, C. M., Clay, K., Brigham, N., & Zigmond, N. (2006). Good high schools for students with disabilities: Introduction to the Special Issue. *Learning Disabilities Research and Practice, 21*(3), 135–145.

Morrell, E., & Duncan-Andrade, J. (2003). What they do learn in school: Hip-hop as a bridge to canonical poetry. In J. Mahiri (Ed.), *What they don't learn in school: Literacy in the lives of urban youth* (pp. 247–268). New York: Peter Lang.

Mpofu, E., & Harley, D. A. (2006). Racial and disability identity: Implications for the career counseling of African Americans with disabilities. *Rehabilitation Counseling Bulletin, 50*(1), 14–23.

Murphy, K. R., Barkley, R. A., & Bush, T. (2002). Young adults with ADHD: Subtype differences in comorbidity, educational, and clinical history. *Journal of Nervous and Mental Disease, 190*, 147–157.

Murray, C. (2003). Risk factors, protective factors, vulnerability, and resilience: A framework for understanding and supporting the adult transitions of youth with high-incidence disabilities. *Remedial and Special Education, 24*, 16–26.

Murray, T. S., McCracken, M., Williams, K., Jones, S., Shillington, R., & Stucken, J. (2009). *Addressing Canada's literacy challenge: A cost–benefit analysis.* Ottawa, ON, Canada: DataAngel.

National Center for Education Statistics. (2005). *Stats in brief.* Washington, DC: U.S. Department of Education.

National Center for Educational Statistics. (2007). The condition of education 2007 in brief. Washington, DC: Author. Retrieved May 2007, from *www.nces.ed.gov/programs/coe.*

National Council on Disability. (2003, May). Addressing the needs of youth with disabilities in the juvenile justice system: The current status of evidence-based research. Washington, DC:

Author. Retrieved February 1, 2005, from *www.ncd.gov/newsroom/publications/2003/juvenile.htm.*

Nelson, J. M. (in press). General and domain-specific self-concept of adults with learning disabilities: A meta-analysis. *Journal of Learning Disabilities.*

Nelson, J. M., & Gregg, N. (2012). Depression and anxiety among transitioning adolescents and college students with ADHD, dyslexia, or comorbid ADHD/dyslexia. *Journal of Attention Disorders, 16*(3), 244–254.

Nelson, J. M., & Harwood, H. (2010). Learning disabilities and anxiety: A meta-analysis. *Journal of Learning Disabilities, 44*, 3–17.

New Literacies Research Team. (2007). New literacies, new challenges, and new opportunities. In M. B. Sampson, S. Szabo, F. Falk-Ross, M. M. Foote, & P. E. Linder (Eds.), *Multiple literacies in the 21st century: The twenty-eighth yearbook of the College Reading Association* (pp. 31–50). Logan, UT: College Reading Association.

Newman, L., Wagner, M., Cameto, R., & Knokey, A. (2009). *The post-high school outcomes of youth with disabilities up to 4 years after high school: A report from the National Longitudinal Transition Study–2 (NLTS2)* [NCSER 2009-3017]. Menlo Park, CA: SRI International.

North Central Regional Education Laboratory. (2003). enGauge 21st Century skills: Literacy in the digital age. Retrieved from *www.ncrel.org/engauge.*

Ochs, L. A., & Roessler, R. T. (2001). Students with disabilities: How ready are they for the 21st century? *Rehabilitation Counseling Bulletin, 49*, 775–781.

Organisation for Economic Cooperation and Development. (2010). Are the new millenium learners making the grade?: Technology use and educational performance in PISA. Retrieved from *www.oecdbookshop.org/oecd/display.asp?k=5kscg4j39dhb&lang=en.*

Osberg, L. (2000). *Schooling, literacy, and individual earnings.* Ottawa: Statistics, Canada, and Human Development.

Oyserman, D., Brickman, D., & Rhodes, M. (2007). Racial ethnic identity: Content and consequences for African American, Latino and Latina youth. In A. Fuligni (Ed.), *Contesting stereotypes and creating identities: Social categories, social identities and educational participation* (pp. 91–114). New York: Russell Sage Foundation.

Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology, 91*, 188–204.

Padak, N., & Baradine, B. (2004). Engaging readers and writers in adult education contexts. *Journal of Adolescent and Adult Literacy, 48*(2), 126–137.

Partnership for 21st Century Skills. (2009). P21 framework definitions. Available: *www.p21.org/index.php?option=com_content&task=view&id=924&185.*

Phelps, L. A., & Hanley-Maxwell, C. (1997). School-to-work transitions for youth with disabilities: A review of outcomes and practices. *Review of Educational Research, 67*, 197–226.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*, 667–686.

Pintrich, P. R., & Schunk, D. (2002). *Motivation in education: Theory, research, and applications* (2nd ed.). Upper Saddle, NJ: Prentice-Hall.

Prout, H. T., Marcal, S. D., & Marcal, D. C. (1992). A meta-analysis of self-reported personality characteristics of children and adolescents with learning disabilities. *Journal of Psychoeducational Assessment, 10*(1), 59–64.

Prout, H. T., & Prout, S. M. (1996). Global self-concept and its relationship to stressful life conditions. In B. A. Bracken (Ed.), *Handbook of self-concept: Developmental, social, and clinical considerations* (pp. 259–286). New York: Wiley.

Raskind, M. H., Goldberg, R. J., Higgins, E. L., & Herman, K. L. (1999). Patterns of change and predictors of success in individuals with learning disabilities: Results from a twenty-year longitudinal study. *Learning Disabilities Research and Practice, 14*, 35–49.

Reiff, H. B., & Gerber, P. J. (1994). Social/emotional and daily living issues for adults with learning disabilities. In P. J. Gerber & H. B. Reiff (Eds.), *Learning disabilities in adulthood: Persisting problems and evolving issues* (pp. 72–81). Boston: Andover Medical.

Reiff, H. B., Gerber, P. J., & Ginsberg, R. (1997). Exceeding expectations: Successful adults with learning disabilities. Austin, TX: Pro-Ed.

Reynolds, A. W. (1999). *High risk college students with emotional disorders as well as learning disabilities.* Unpublished dissertation, University of Georgia, Athens.

Riddick, B., Sterling, C., Farmer, M., & Morgan, S. (1999). Self-esteem and anxiety in the educational histories of adult dyslexic students. *Dyslexia, 5*, 227–248.

Rojewski, J. (1996). Occupational aspirations and early career choice patterns of adolescents with and without learning disabilities. *Learning Disability Quarterly, 19*, 99–116.

Rojewski, J. (1999). Occupational and educational aspirations and attainment of young adults with

and without learning disabilities two years after high school completion. *Journal of Learning Disabilities, 32*, 533–552.

Rojewski, J. W., & Gregg, N. (2011). Career choice patterns and behaviors of work-bound youth with high incidence disabilities. In J. M. Kaufman & D. P. Hallahan (Eds.), *Handbook of special education* (pp. 584–594). New York: Routledge.

Rojewski, J. W., & Kim, H. (2003). Career choice patterns and behavior of work-bound youth during early adolescence. *Journal of Career Development, 30*, 89–108.

Rojewski, J. W., Lee, H., Gemici, S., & Gregg, N. (2011a). [Intermediate postsecondary educational outcomes of adolescents with high incidence disabilities compared to nondisabled peers]. Unpublished raw data.

Rojewski, J. W., Lee, H., Gemici, S., & Gregg, N. (2011b, August). *Longitudinal growth patterns of occupational aspirations of individuals with high incidence disabilities*. Washington, DC: American Psychological Association.

Rojewski, J. W., Lee, H., Gregg, N., & Gemici, S. (2012). Prominent factors affecting the formation and longitudinal growth patterns of occupational aspirations of adolescents with high incidence disabilities. *Exceptional Children, 78*(1), 157–178.

Rojewski, J. W., & Yang, B. (1997). Longitudinal analysis of select influences on adolescents' occupational aspirations. *Journal of Vocational Behavior, 51*, 375–410.

Ross-Gordan, J. M. (1996). Sociocultural issues affecting the identification and service delivery models for adults with learning disabilities. In N. Gregg, C. Hoy, & A. Gay (Eds.), *Adults with learning disabilities: Theoretical and practical perspectives* (pp. 85–126). New York: Guilford Press.

Rothman, H., & Cosden, M. (1995). The relationship between self-perception of a learning disability and achievement, self-concept, and social support. *Learning Disability Quarterly, 18*, 203–221.

Rubin, L. M., McCoach, B., McGuire, J. M., & Reis, S. M. (2003). The differential impact of academic self-regulatory methods on academic achievement among university students with and without learning disabilities. *Journal of Learning Disabilities, 36*, 270–286.

Rudd, R., Kirsch, I., & Yamoto, K. (2004). *Health, literacy in America*. Princeton, NJ: Educational Testing Service.

Ryan, R. M., Connell, J. P., & Plant, R. W. (1990). Emotions in non-directed text learning. *Learning and Individual Differences, 2*, 1–17.

Schoon, I., & Parsons, S. (2002). Teenage aspirations for future careers and occupational outcomes. *Journal of Vocational Behavior, 60*, 262–288.

Schraw, G., & Lehman, S. (2001). Situational interest: A review of the literature and directions for future research. *Educational Psychology Review, 13*, 23–52.

Semrud-Clikeman, M., Biederman, J., Sprich-Buckminster, S., Lehman, B. K., Faraone, S. V., & Norman, D. (1992). Comorbidity between ADHD and learning disability: A review and report in a clinically referred sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*, 439–448.

Semrud-Clikeman, M., Guy, K., Griffin, J. D., & Hynd, G. W. (2000). Rapid naming deficits in children and adolescents with reading disabilities and attention deficit hyperactivity disorder. *Brain and Language, 74*, 7–83.

Silva, E. (2008). Measuring skills for the 21st century. Washington, DC: Education Sector. Available: *www.educationsector.org/publications/measuring-skills-21st-century [Oct. 2011].*

Smith, R. (2010). Feeling supported: Curricular learning communities for basic skills courses and students who speak English as a second language. *Community College Review, 37*(3), 261–284.

Soep, E., & Chavez, V. (2005).Youth Radio and the pedagogy of collegiality. *Harvard Educational Review, 75*(4), 409–434.

Spekman, N. J., Goldberg, R. J., & Herman, K. L. (1992). Learning disabled children grow up: A search for factors related to success in the young adult years. *Learning Disabilities Research and Practice, 7*, 161–170.

Stenhjem, P. (2005, February). Youth with disabilities in the juvenile justice system: Prevention and intervention strategies. National Center on Secondary Education and transition. Retrieved April 5, 2007, from *www.ncset.org/publications/viewdesc.asp?id=1929.*

Stodden, R., Jones, M., & Chang, K. (2002). *Services, supports and accommodations for individuals with disabilities: An analysis across secondary education, postsecondary education, and employment* (White Paper). Manoa: University of Hawaii at Manoa, National Center on Secondary Education and Transition. Retrieved March 24, 2003, from *http://ncset.hawaii.edu.*

Stone, C. A., & May, A. L. (2002). The accuracy of academic self-evaluations in adolescents with learning disabilities. *Journal of Learning Disabilities, 35*(4), 370–383.

Stone, E. F., Stone, D. L., & Dipboye, R. L. (1992).

Stigmas in organizations: Race, handicaps, and physical unattractiveness. In K. Kelly (Ed.), *Issues, theory, and research in industrial and organizational psychology* (pp. 385–457). New York: Elsevier Science.

Swanson, H. L., & Hsieh, C. (2009). Reading disabilities in adults: A selective meta-analysis of the literature. *Review of Educational Research, 79*, 1362–1390.

Trainor, A. (2007). Perceptions of adolescent girls with LD regarding self-determination and postsecondary transition planning. *Learning Disabilities Quarterly, 23*, 224–232.

Unger, D. (2001). *Employers' attitudes towards persons with disabilities in the workforce: Myths or realities?* Manuscript submitted for publication.

U.S. General Accounting Office. (2003, July). Special education federal actions can assist states in improving postsecondary outcomes for youth (GAO, 03-773). Washington, DC: Author. Retrieved May 5, 2003, from *www.gao.gov/new.items/do3773.pdf.*

Vallerand, R. J., & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study. *Journal of Personality, 60*, 599–620.

van den Broek, M., Verschelden, G., & Boonaert, T. (2008). E-learning in a low-status female profession: The role of motivation, anxiety and social support in the learning divide. *Journal of Computer Assisted Learning, 24*, 181–190.

Vrugt, A., Oort, F. J., & Zeeberg, C. (2002). Goal orientations, perceived self-efficacy and study results amongst beginners and advanced students. *Educational Psychology, 72*, 385–397.

Wade, S. E., Buxton, W. M., & Kelly, M. (1999). Using think-alouds to examine reader-text interest. *Reading Research Quarterly, 34*(2), 194–216.

Wagner, M., Newman, L., Cameto, R., Garza, N., & Levine, P. (2005). After high school: A report from the National Longitudinal Transition Study–2 (NLTS-2). Menlo Park, CA: SRI International. Retrieved February 7, 2007, from: *www.nlts2.org.*

Werner, E. F. (1993). Risk and resilience in individuals with learning disabilities: Lessons learned from the Kauai Longitudinal Study. *Learning Disabilities Research and Practice, 8*, 28–35.

Werner, E. E., & Smith, R. S. (1982). *Vulnerable but invincible: A longitudinal study of resilient children and youth.* New York: McGraw-Hill.

Wessel, R. D., Jones, J. A., Markle, L., & Westfall, C. (2009). Retention and graduation of students with disabilities: Facilitating student success. *Journal of Postsecondary Education and Disability, 21*(3), 116–125.

Wigfield, A., & Wentzel, K. R. (2007). Introduction to motivation at school: Interventions that work. *Educational Psychologists, 42*(4), 191–196.

Worthington, R. L., Flores, L. Y., & Navarro, R. L. (2005). Career development in context: Research with people of color. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 225–252). Hoboken, NJ: Wiley.

Young, G., & Brown, J. (2005). Learning disabilities/dyslexia and employment—a mythical view. In G. Reid & A. Fawcett (Eds.), *Dyslexia in context: Research, policy and practice* (pp. 25–59). London: Whurr.

Zhang, S., & Duke, N. K. (2008). Strategies for Internet reading with different reading purposes: A descriptive study of 12 good Internet readers. *Journal of Literacy Research, 40*(1), 128–162.