Employment Instruction for Secondary Students with Autism Spectrum Disorder: A Systematic Review of the Literature

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Abstract: Individuals with autism spectrum disorder (ASD) often struggle with features of adult life, including obtaining and maintaining gainful employment. Many factors seem to contribute to this issue, such as: (a) access to financial resources, (b) interaction between the unique characteristics of ASD and employment settings, and (c) curriculum and instructional practices in secondary special education that may not focus specifically on the procurement of employment. An additional area that may be a factor is the paucity of research on employment development for students with ASD while attending middle and high school programs. This article examined the research on teaching strategies used to develop employment skills among secondary students with ASD between the ages 14–22. Twelve studies were identified with a total of 55 participants with ASD. A summary of the articles meeting the inclusion criteria is provided along with recommendations for future research.

Questions about how adolescents and adults with developmental disabilities can and should be taught functional skills have been a focus in the literature since the introduction of the criterion of ultimate functioning as a guiding principle in special education (Brown, Nietupski, & Hamre-Nietupski, 1976). What should be taught and how is a major consideration for any instructional program. The literature is replete with studies demonstrating the effectiveness of systematic instruction techniques used to teach a wide range of skills to adolescents with various disabilities (Test et al., 2009). Clearly, teaching employability and daily living skills, among others, has enjoyed some of this attention (Test et al., 2009). There does, however, seem to be a gap in the literature reporting on adolescents with ASD receiving direct instruction in employment skills, or job skills, while in middle and high school. Most of the intervention research on individuals with ASD has focused on young children with very little attention given to adolescents (Gerhardt & Weiss, 2011), including employment skills (Hendricks, 2010; Hendricks & Wehman, 2009).

Recent prevalence data place the occurrence of ASD in the United States at an average rate of 1 in 110, representing a sizable increase over the last two decades (Centers for Disease Control and Prevention, 2011). In their report to Congress, the United States Department of Education (US-DOE, 2007) reported that the prevalence of ASD in the American school system increased by 410% among children ages 6–11 from 1996 to 2005. During that period, there was a 514% increase among students with ASD ages 14 and older, and there was a 317% increase among students with ASD ages 18–21 (US-DOE, 2007). This represents a substantial increase in the number of students with ASD requiring programming at the secondary level and a formidable challenge for schools (Gerhardt & Weiss, 2011).

Concomitant increases have been reported among adults with ASD seeking services. Cimera and Cowan (2009) reported a 121% increase in the number of adults with ASD requesting assistance from Vocational Rehabilitation (VR) between 2002–2006. This unprecedented increase in the number of individuals with ASD clearly leads to a need for more services, particularly as this population...
begins to age. Unfortunately, post-school options remain limited, and many adults with ASD struggle with features of adult life, particularly, employment. Indeed, the overall unemployment rate for people with disabilities is as high as 68% (Harris Interactive, as cited by The President’s Committee for People with Intellectual Disabilities, 2009). It is estimated that this rate increases to 80% for those with intellectual disability (InD, The President’s Committee for People with Intellectual Disabilities, 2009), and this rate may be even higher for those with ASD when considering both unemployment and underemployment (National Autism Society, as cited by Holmes, 2007). Moreover, the overall unemployment rate for people with disabilities has not changed very much over the last three decades, indicating a disturbing, yet stable trend (Harris Interactive, as cited by The President’s Committee for People with Intellectual Disabilities, 2009).

Supported employment (SE) is a service to help people with disabilities achieve gainful employment (Rusch & Hughes, 1989). Although SE was designed to improve the prospects of gainful employment for most individuals, in spite of need, it remains quite elusive for people with severe disabilities (Rusch & Braddock, 2004), including those with ASD deemed “too disabled” to benefit from SE or other assistance through VR (Cimera & Cowan, 2009; Lawer, Brusilovskiy, Salzer, & Mandell, 2009). For those individuals with ASD who do qualify for VR and SE services, the costs of the supports are higher than all other disability groups except for people with sensory impairments (e.g., vision and hearing impairments, Cimera & Cowan, 2009). Furthermore, when compared to other workers with disabilities receiving VR services, those with ASD tend to work fewer hours and earn a lower weekly wage (Cimera & Cowan, 2009).

Considering the unemployment/underemployment rates, the higher costs associated with VR services, and that some individuals with ASD are considered “too disabled” by VR to receive SE services, it seems clear that many individuals with ASD are exiting public school ill-prepared to obtain employment. Undeniably, post school outcomes for people with ASD and other disabilities are likely the function of a multifaceted problem involving the unique characteristics of the individual (Gerhardt & Weiss, 2011), school practices (Getzel & deFur, 1997), adult service agency providers (Parsons, Reid, Green & Browning, 1999; 2001), and funders (Rusch & Braddock, 2004; Wehman, 2006), to name a few. The limited body of research available to guide educators’ instructional practices does not make policy or practice any easier and may actually be an underlying contributing factor to the limited success now reported (Hendricks, 2010, Hendricks & Wehman, 2009).

A closer examination of the supports offered to individuals with ASD, and specifically, the instructional supports and tactics used with secondary students, may help frame a complete understanding of how these students are prepared for employment once they exit school. Educator knowledge of evidenced-based tactics for use with transition-aged students with ASD may even lead to the development of student skills that result in qualitatively different post-school outcomes for older adolescents and adults with ASD. Recently, Test et al. (2009) analyzed studies that investigated instructional tactics used to teach a variety of skills to transition-aged students with various disabilities. Included in the review were studies on employment and job skills. However, the studies reviewed were not exclusive to students with ASD, as many of the included participants experienced other disabilities. In another recent review of the literature, Hendricks (2010) reported studies focusing on factors related to employment for adults with ASD. Included in this article was a review of SE programs for adults with ASD, as well as a limited number of intervention studies targeting adults. Although a number of SE programs and promising studies were reviewed, there were limited studies with a central focus on specific instructional tactics that were used to teach adolescents with ASD. In another study, Hendricks and Wehman (2009) provided a comprehensive review of programming for students with ASD transitioning from school to post-school environments. Many of the studies reviewed that were related to instructional strategies focused on topics such as behavior reduction programming, language development, and literacy. Few of the studies included any discussion of targeted job skill development. Thus, the pri-
mary purpose of the current investigation was to conduct a systematic review of the literature on instructional tactics used to teach employment skills to secondary students with ASD. A secondary purpose was to refine the scope of the literature reviews reported by Hendricks and Wehman (2009) and Hendricks (2010) by limiting the current review along three dimensions: (a) age of the participants, (b) employment skills as the goal, and (c) teaching strategies. In that vein, the following research questions were posed:

1. How many studies were reported in the peer-reviewed literature with a focus on teaching employment skills to individuals with ASD between the ages of 14–22?
2. What were the instructional tactics used to teach employment skills to secondary students with ASD between the ages of 14–22?
3. What was the efficacy of the instructional tactics used to teach employment skills to secondary students with ASD between the ages of 14–22?

Method

Journal articles from the peer-reviewed literature from 1995–2010 with a focus on teaching employment skills to secondary students (ages 14–22 years) with ASD were reviewed. For this review, autism spectrum disorder included autistic disorder, Asperger Syndrome, and Pervasive Developmental Disorder-Not Otherwise Specified. Additionally for this review, employment skills included job specific skills and social skills that are likely to benefit one’s employment status. Hand searches were conducted in the following journals: Autism, Career Development for Exceptional Individuals, Education and Training in Autism and Developmental Disabilities, Focus on Autism and Other Developmental Disabilities, and the Journal of Applied Behavior Analysis. Electronic databases were also searched including, ERIC, Education Full Text, EBSCO, PsychINFO, and PsychArticles. Keywords for the database search included the word “autism” paired with each of the following: Vocational instruction, employment instruction, secondary education, vocational education, employment, and employability. Finally, a bibliographic search of the research reports meeting the inclusion criteria and relevant reviews of the literature on the topic was conducted (Wolery & Lane, 2010).

Publications selected for review met the following criteria. First, two-thirds of the participants had to be between the ages of 14–22. The two-thirds ratio was selected to capture studies with secondary special education programming as a central focus, and to eliminate studies comprised of a majority of younger students (e.g., preschool and elementary) as well as adult participants who completed their schooling. Additionally, this age range was selected because it represents the period when transition planning and instruction should occur. Second, 50% of the participants had to have a diagnosis of ASD. This criterion was chosen so that studies reviewed had at least a balanced representation of individuals with ASD in their participant pool. Third, the independent variable had to be an intervention designed to improve the participants’ employment skills. Fourth, the dependent variable had to be job related skills or social skills related to employment, exclusive of reducing problem behavior. Studies that focused on preference assessments to increase work performance were also included in the review. Finally, studies had to be published in the peer-reviewed literature between 1995–2010.

Results

Twelve studies met the inclusion criteria. Overall, each study focused on some aspect of employment instruction for adolescents and young adults with ASD. At least 50% of all the participants in the studies reviewed had a diagnosis on the autism spectrum, and two-thirds of the participants were between the ages 14–22, with the exception of the study by Agran et al. (2005). In that study, 2 of the 6 participants were identified as having ASD and one was in the process of being diagnosed with ASD. The total participants with ASD among all reviewed studies was n = 55 (see Table 1).

In response to research question one, there were very few studies that met the inclusion criteria. One study met the criteria from 1995 to 2004. However, 11 studies met the inclusion criteria from 2005–2010, with an increasing
trend during this period. Notwithstanding this publication increase over the last few years, there remains a paucity of literature examining employment skill development among adolescents with ASD (see Figure 1).

In response to research question two, all the studies examined various tactics to increase independent completion of employment tasks or behaviors related to employment. The studies were conducted in vocational classrooms, academic classrooms, non-classroom school settings, stores, homes, and other community settings (see Table 2). Four of the studies investigated self-management strategies to enhance task completion. These studies taught self-management using component strategies of Behavior Skills Training (BST) (e.g., instruction, modeling, practice, and feedback). They also used ancillary materials to facilitate self-management, including token systems, picture prompts, and Personal Digital Assistants (PDAs). Six studies explored the effects of video modeling (either singularly, as part of an intervention package, or as part of a comparison of tactics) on skill development/enhancement. An additional study examined BST with and without a text message cueing system, as well as the reverse. The remaining study investigated the effects of high v. low preferred items on task completion.

In response to research question three, many of the studies reported positive effects resulting from the intervention, or detailed more effective strategies for those studies comparing instruction tactics. Two studies presented a more modest appraisal of the effects of the intervention on employment skills (Allen, Wallace, Renes, Bowen, & Burke, 2010; Copeland & Hughes, 2000). Finally, several studies reported details regarding various degrees of generalization and/or maintenance of the targeted skills (see Table 2).

**Discussion**

The purpose of the current study was to examine the extant literature on teaching employment skills to individuals with ASD be-
tween the ages of 14–22. The primary finding from this inquiry was that there is a significant gap in the literature pertaining to this topic as only 12 studies were identified that met the search criteria. Although not specifically focused on teaching employment skills to students of this age group, other researchers reported similar findings in their reviews of the literature on transition planning and employment outcomes for individuals with ASD (e.g., Hendricks, 2010; Hendricks & Wehman, 2009).

Recent education legislation requires instructional strategies and interventions to be evidenced-based. What constitutes an evidence-based practice has generated debate and resulted in the development of guidelines for determining the quality and scope of research investigating a given instructional strategy (Odom et al., 2005). Although the purpose of this paper was not to evaluate whether the individual studies reviewed constituted evidence-based practices, we contend that the amount of studies available addressing employment skill development to be limited in scope along several dimensions laid out by Horner et al. (2005) and Kratochwill et al. (2010). First, there was a limited amount of studies addressing employment skill instruction to be limited in scope along several dimensions laid out by Horner et al. (2005) and Kratochwill et al. (2010). First, there was a limited amount of studies addressing job specific skill instruction. Second, no studies were identified that targeted social skills needed for employment. Deficits in social skills are a core aspect of the disability (American Psychiatric Association, 2000), and many have declared that difficulties in this area are a major barrier to meaningful community inclusion, including obtaining gainful employment (Gerhardt & Weiss, 2011; Hendricks, 2010; Hendricks & Wehman, 2009; Targett & Wehman, 2009). Clearly, additional studies examining strategies to improve social skills for employment for adolescents and adults with ASD are desperately needed. Next, there were too few participants with ASD at the secondary level included in the current literature base on employment development. Many studies were excluded from the investigation because there was a lack of participants with ASD, as well as a lack of students between 14–22 years old. Finally, there were too few research teams producing research on this topic. Indeed, three of the 12 studies were by the same team investigating similar tactics (see Table 2). An increase in research productivity is clearly needed so that educators become better informed about practices to adopt in their secondary special education classrooms.

Undoubtedly, much of the current literature on the education and treatment of individuals with ASD has centered on young chil-
Although the present investigation reveals that some instructional strategies that were effective with younger students can be effective with older students, knowledge of the parameters of using these and other instructional tactics with adolescents is relatively unknown. The application of these strategies

<table>
<thead>
<tr>
<th>Author(s) (year)</th>
<th>Intervention</th>
<th>Skills Taught</th>
<th>Setting</th>
<th>Generalization and/or Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agran, Sinclair, Alper, Cavin, Wehmeyer, &amp; Hughes (2005)</td>
<td>Self-monitoring taught via behavior skills training</td>
<td>Following Directions</td>
<td>Multiple classrooms</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Burke, Andersen, Bowen, Howard, &amp; Allen (2010)</td>
<td>Study 1: BST and PDA cueing system (when needed)</td>
<td>Perform in Air-Inflated Mascots</td>
<td>Warehouse</td>
<td>Study 1: Both</td>
</tr>
<tr>
<td></td>
<td>Study 2: PDA cueing system and BST (when needed)</td>
<td></td>
<td></td>
<td>Study 2: Both</td>
</tr>
<tr>
<td>Cihak &amp; Schrader (2008)</td>
<td>Video self-modeling vs. video adult modeling</td>
<td>Vocational and pre-vocational tasks</td>
<td>Faculty work room and classroom</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Copeland &amp; Hughes (2000)</td>
<td>Self-monitoring via picture prompts</td>
<td>Vocational task completion</td>
<td>Faculty dining room &amp; Hotel Classroom</td>
<td>No</td>
</tr>
<tr>
<td>Ganz &amp; Sigafoos (2005)</td>
<td>Self-management via using a token system</td>
<td>Task completion for student with ASD</td>
<td></td>
<td>Generalization noted anecdotally</td>
</tr>
<tr>
<td>Graff, Gibson, &amp; Galiatsatos (2006)</td>
<td>Used preference assessments and reinforcer assessment to evaluate the effects of high preferred v low preferred items on task completion</td>
<td>Task completion</td>
<td>Classroom</td>
<td>No</td>
</tr>
<tr>
<td>Mechling, Gast, &amp; Seid (2009)</td>
<td>Video, auditory, &amp; picture prompts on PDA</td>
<td>Cooking</td>
<td>Classroom</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Mechling &amp; Gustafson (2008)</td>
<td>Static picture prompts v. video modeling</td>
<td>Cooking</td>
<td>Classroom</td>
<td>No</td>
</tr>
<tr>
<td>Van Laarhoven, Van Laarhoven-Myers, &amp; Zurita (2007)</td>
<td>Video modeling package consisting of video rehearsal, video feedback, and error correction</td>
<td>Vocational skills</td>
<td>Restaurants</td>
<td>Maintenance</td>
</tr>
</tbody>
</table>
may require different approaches when applied with older students. Pertinent questions such as (a) the density of instruction for secondary vs. elementary students, (b) the application of strategies to community-based settings, and (c) implementing employment instruction in community settings with potentially decreased support represent just a few questions with limited answers regarding employment instruction for students with ASD. This issue becomes particularly important considering recent years have seen a burgeoning growth of students with ASD at the secondary level (US-DOE, 2007), as well as associated increases reported in agencies serving adults who completed school (Cimera & Cowan, 2009; Lawer et al., 2009). This trend is likely to continue considering the increasing elementary population reported by the US DOE. The results from the current study do not bode well with these prevalence data, and the brevity of research on secondary special education programming applied to students with ASD could be a contributor to the poor employment outcomes experienced by these individuals now and in the future.

Similar arguments can be made regarding the application of instructional tactics used with students with other disabilities. Unquestionably, a number of studies on employment instruction and related transition practices have been reported in the literature (Test et al., 2009). Nevertheless, the characteristics of students with ASD are different from other disabilities and they can present unique challenges. Tactics used with other students may prove to be applicable to students with ASD; however, this remains an empirical question yet to be answered.

Despite the scarcity of research on employment instruction for students with ASD, several studies were reviewed that may contribute to preparing secondary students with ASD for employment. Many of the studies reviewed examined tactics to increase independent employment skills through self-management packages or video modeling with favorable results. Some studies included features of both self-management and video modeling (e.g., Mechling, Gast, & Seid, 2009). Others compared the type of model (self v. another adult) used in the video, showing both to be effective, but self-modeling possibly more efficient for some participants (Cihak & Schrader, 2008). Still other studies along this line compared static picture prompts to video modeling, highlighting that the video-based instruction may be more effective for some adolescents with ASD (Mechling & Gustafson, 2008). In addition to the studies on self-management and video modeling, an intervention package comprised of Behavior Skills Training (BST) and text message cueing was used in another study with encouraging results (Burke, Andersen, Bowen, Howard, & Allen, 2010). Finally, Graff, Gibson, and Galiatsatos (2006) provided an illustration of highly preferred items being more effective than less preferred items as a maintaining variable of task completion. This finding is encouraging and has been demonstrated with varying populations and tasks (e.g., Carr, Nicolson, & Higbee, 2000; DeLeon et al., 2001). Together, these studies represent a budding literature base for teaching, or enhancing, employment skills for students with ASD.

The current findings should be interpreted in the context of the following limitations. It is possible that our search criteria were too narrow. Again, this review included studies composed of at least half of the participants being identified with ASD, and 66% of the participants between the ages of 14–22. Perhaps additional instructional strategies would have been located had different ratios of participant diagnoses been used, as well as different age ranges. Indeed, there were studies that explored these issues with participant groups composed of less than 50% of individuals with ASD (e.g., Riffel et al., 2005) and individuals outside the age range criteria of the current study (e.g., Lattimore, Parsons, & Reid, 2006). Importantly, however, the diagnostic ratio and age ranges used in this study were deemed germane to this literature review on developing employment skills specifically for students with ASD involved in secondary and transition programming. The journals selected for the hand search, the keywords used for the database search, and the databases searched may have limited the findings, as well. It is possible that other studies exist that fell outside these search criteria, and future investigators may locate additional studies not identified in this review by modifying the search criteria.
For reasons yet to be fully explained there is an increase in the student population of children with ASD served by public schools at all grade levels (US-DOE, 2007). Using the prevalence data provided by the US DOE on children with ASD between the ages of 6–11, we can expect to see continuing growth of the student population at the secondary level and beyond. Therefore, it behooves our field, and the children and adolescents we serve, to begin rigorous lines of research exploring the most effective means of preparing them for employment.

References


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