Mounting evidence suggests that employment outcomes among adults with autism spectrum disorder (ASD) are poor with employment estimates in ASD ranging from 10%–50% (Autism Speaks, 2009; Hendricks, 2010; Levy and Perry, 2011; Shattuck et al., 2012). Even if employment is achieved, positions held by persons with ASD tend to be part-time (Taylor and Seltzer, 2011), menial (Taylor and Seltzer, 2011), and low skilled (Levy and Perry, 2011). These findings are particularly concerning given literature suggesting that work potentially offers heightened self-esteem and quality of life (Shogren and Plotner, 2012). Moreover, failing to effectively support this largely untapped labor market risks productivity loss, with potential negative impacts for persons with ASD, families, and communities.

In their review article, VanBergeijk et al. (2008) argue that the transition from high school to employment requires careful planning to ensure that adolescents are well prepared prior to leaving school. They recommend a conscientious effort on the part of the school system and community. Yet in a large population-based sample, Shattuck et al. (2012) report that more than half of the sample with ASD were not employed or in post-secondary education by 2 years after high school graduation, yet that number decreased to 11% by 4 years after high school exit. Youth with ASD had significantly lower rates of employment and higher rates of “no participation” relative to peers with speech language impairment, learning disability, and mental retardation (Shattuck et al., 2012). Of note, cognitively able adults with autism are more likely to achieve employment relative to peers with both ASD and intellectual disabilities (Graetz, 2010; Howlin and Moss, 2012; Seltzer et al., 2004), and cognitively able persons with autism have fewer symptoms and problematic behaviors, greater functional independence (Levy and Perry, 2011), and are more likely to be in post-secondary education or employment (Shattuck et al., 2012).

The literature identifies a range of challenges for adults with ASD in achieving stable employment (Hendricks,
2010; Howlin, 2000; Howlin and Moss, 2012; Hurlbutt, 2004; Nicholas and Roberts, 2012; Shattuck et al., 2012). Challenges include difficulty with the hiring process, and a lack of responsiveness and accommodation in the workplace (Richards, 2012). Job interviewing requires social skills that can be difficult for many individuals with ASD (Richards, 2012). Beyond the challenges of acquiring employment, work settings offer multiple complex difficulties such as challenging physical, social, and sensory environments, and a general lack of effective supports (Kreiger et al., 2012; Richards, 2012; Van Wieren et al., 2008, 2012).

Overall, the literature suggests dissatisfaction with existing ASD vocational supports (Nicholas and Roberts, 2012; Richards, 2012; Van Wieren et al., 2008, 2012). The pervasiveness and multiplicity of barriers invite greater understanding about key issues and ameliorative ways to navigate vocational possibility for persons with ASD. Although there has been improved recognition of the need for vocational services, this need is not strongly informed by epidemiological research or needs assessment, and hence this field continues to be limited by a generalized lack of a research-based approach. Taylor et al. (2012) recently published a systematic review comprising a synthesis of five vocational interventions for youth and adults with ASD, with a focus on studies addressing the transition to adulthood, published since 1980, and with a sample size of ≥20 participants. Unfortunately, their review found little evidence for vocational treatment approaches due to poor methodological quality within existing studies. The authors conclude that “no study used random assignment, making it difficult to draw conclusions about the effectiveness of the programs” (p. 536), and they raise concern that supported employment interventions are particularly understudied.

More broadly, some literature examines interventions and models for intervention for the larger developmental and/or intellectual disability population. A study by Migliore and Butterworth (2008) examined outcomes of a vocational rehabilitation program for individuals with developmental disabilities (DD). The authors found that while employee wages did increase and accommodated inflation, wages were still very close to the poverty threshold. Additionally, between the study period of 1995–2005, a similar amount of time was needed for service users to obtain employment. Mayee and Swain (2009) present a desired intervention model in which supported employment extends beyond job coaching and training, and lasts for the long term, including job progress monitoring, financial assistance, and planning such as when the employee draws a wage, job change, or advancement assistance, support, and training for co-workers, integration into work culture, and monitoring the satisfaction of the employee and employer.

In a longitudinal study by Stephens et al. (2005) involving 2760 individuals with DD, those who became employed increased their adaptive skills, which subsequently decreased if they left the employment. Furthermore, the more competitive the employment, the more that individuals’ adaptive skills were bolstered, suggesting that competitive employment may improve an individual’s capacity to navigate the community. Jordan de Urries et al. (2005) reported that individuals who were involved in supported employment models, as opposed to sheltered employment, had longer terms of employment and higher salaries.

A meta-analysis by Wehmeyer et al. (2006) examined how technology use impacted the employment outcomes for people with intellectual and DD. A wide range of technologies were used, with a generally positive effect reported. Moreover, interventions that utilized technology with universal design features, such as different input and output options (e.g. visual and audio) or had more accessible features (e.g. larger buttons), were reportedly more effective. Canella-Malone et al. (2006) compared video prompting to video modeling in teaching living skills to adults with DD and found that video prompting (shorter video clips displaying one task each) was effective in all but one case compared to video modeling (one long video showing all skills). In a later study, Goodson et al. (2007) attempted to teach domestic skills to individuals with DD using video clips. However, this was determined to be largely ineffective until an error-correction procedure was initiated involving reviewing the clip and an in-person trainer completing the task, at which point the intervention became consistently effective. Chang et al. (2011) utilized a smart phone for prompting two employees with cognitive and DD at a food service workplace. Both individuals showed a significant increase in job performance when using the prompting tool.

Overall, the studies suggest promise in supporting individuals with disability in the workplace. However, little is known about the application of vocational supports specifically with individuals with ASD. While the broader literature appears to indicate program effect, there is little to ascertain whether persons with ASD have specific barriers that uniquely reflect their profile. This merits a review of evaluation studies that focus specifically on ASD.

**Purpose of the study**

To address these gaps and conceptually ascertain the overall state of the vocational support intervention literature in ASD, review of this literature was conducted. The aim of this synthesis was to identify studies addressing employment supports in ASD including studies that examine employment acquisition and retention. The guiding premise of “vocation” entailed an inclusive definition that moved beyond only employment as an outcome, as vocation is deemed to more broadly comprise meaningful, routine, sustained activity that is growth provoking, personally rewarding, and often associated with the provision of a living wage.
Table 1. Yield from database search queries.

<table>
<thead>
<tr>
<th>Database</th>
<th>No. of retrieved studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMBASE (biomedical literature, European and Asian focus)</td>
<td>8486</td>
</tr>
<tr>
<td>Medline (biomedical literature, North American focus)</td>
<td>8758</td>
</tr>
<tr>
<td>PsycINFO (psychology and some psychiatry)</td>
<td>12,982</td>
</tr>
<tr>
<td>CCTR (Cochrane controlled trials register)</td>
<td>438</td>
</tr>
<tr>
<td>ERIC (education)</td>
<td>3694</td>
</tr>
<tr>
<td>Total</td>
<td>34,358</td>
</tr>
<tr>
<td>Revised total (after duplications removed across database search queries)</td>
<td>22,878</td>
</tr>
</tbody>
</table>

Methods

As part of a broader systematic review of ASD interventions across the lifespan, peer-reviewed articles that both identified vocational interventions in ASD and were published before 2012 were reviewed using a critical interpretive synthesis approach (Dixon-Woods et al., 2005). Critical interpretive synthesis is a recently established method comprising the pooling of a body of literature in order to distill conceptual understandings or mid-range theoretical perspectives addressing a substantive meta-level question under study (Dixon-Woods et al., 2005). This review included both quantitative and qualitative data in mixed-design studies, and entailed a critical review of the nature and quality of evidence in yielding synthesized themes. Both induction and interpretation were a part of this synthesis approach, in which its central focus was upon the development of concepts and theories within the literature. Established approaches undertaken to achieve this end were (a) reciprocal translation synthesis in which key understandings from primary studies were retrieved, identified, and synthesized; (b) refutational synthesis in which diverse findings were highlighted for their contrast with one another; and (c) line of argument synthesis that elicited generalized understandings of the literature (Dixon-Woods et al., 2006). These processes are akin to grounded theory procedures of constant comparison both within and across primary studies such that each primary study was examined as an independent unit of analysis (Dixon-Woods et al., 2006). Specific criteria for study inclusion in the review comprised the presence of a vocational intervention and the presentation of evaluation data. Experimental, quasi-experimental, cross-sectional, qualitative, and mixed-methods designs were eligible for inclusion in order to broadly address the breadth of existing literature.

To comprehensively identify relevant studies, key terms were searched within repositories of published and unpublished literature. Databases comprised Cochrane, Scholar’s Portal, CINAHL, EMBASE, ERIC, Medline, PsycINFO, and gray literature (i.e., www.osti.gov/graylit/about.html, Google scholar, Google, review of key ASD Association websites). A Cochrane collaboration–trained synthesis/systematic review librarian led the literature search. All identified articles were reviewed using a three-stage retrieval and synthesis process comprising (a) initial screening (review of database-generated titles/abstracts based on keywords), (b) strict screening for inclusion/exclusion criteria, and (c) data extraction and article review. The review process comprised extensive training of research assistants for consistent data extraction, review of findings by two blinded reviewers, and inter-rater reliability established among reviewers (and an additional reviewer, if consensus was not achieved).

Synthesis findings were generated through a focus on conceptual content including outcomes and themes within and across studies. To this end, a conceptual schema was developed for the cross-comparison of studies whereby interventions and their outcomes were individually reviewed and analyzed, and then categorized relative to common themes.

Results

From our larger intervention-based systematic review, database searching initially sought published intervention studies for persons with ASD across the lifespan. Table 1 outlines search results from which this focused identification of vocation-based studies was derived.

The initial search of the literature yielded 22,878 autism-related intervention studies, not restricted by age or interventional focus. After the articles were reviewed for broad inclusion criteria (as outlined above), the total number of articles was decreased to 3974. Of the 3974 articles identifying an ASD intervention, 501 studies (12.6%) targeted participants 18 years of age or older. We then reviewed only those articles for specific elements related to vocational intervention and outcome. In total, only 10 studies were found that evaluated vocation-related interventions in ASD. The following broad areas of ASD vocation were reported: (a) supported employment comprising community placement and job coaching (eight studies: Garcia-Villamisar et al., 2000; Garcia-Villamisar and Hughes, 2007; Hillier et al., 2007; Howlin et al., 2005; Lattimore et al., 2006; Lawer et al., 2009; McClannahan et al., 2002; Mawhood and Howlin, 1999), and (b) technology-related applications including media and online use (two studies: Allen et al., 2010; Burke et al., 2010). Each
of these approaches is briefly described below along with related concepts and selected study examples from this body of literature. Specific studies that were reviewed are summarized in Table 2 in Appendix 1.

This vocational literature in ASD is not yet substantial and generally focuses disproportionately on the cognitively able autism population. Of the 10 studies included in this review, four specifically identified participants with Asperger’s Syndrome (Allen et al., 2010; Burke et al., 2010; Howlin et al., 2005; Mawhood and Howlin, 1999), and most include a substantial proportion of more cognitively able persons with ASD. The literature further focuses on supported employment with an emerging focus on technology-related tools (e.g., media, online application) for augmentation. Each of these substantive areas is addressed below.

Supported employment

Supported employment is defined as the “process of enabling a person with a disability to secure and maintain paid work that is in a regular work environment” (Pozner and Hammond, as cited in Mawhood and Howlin, 1999: 231). It tends to involve some degree of formal training for employment preparedness, job matching according to abilities and propensities of the individual, and ongoing support in the workplace. The supported employment approach has largely been used for facilitating employment success for individuals who are more intellectually able, although success has been demonstrated with individuals with lower IQ, education, and language ability. Supported employment generally focuses on the vocational tasks required of a job, including micro- and mezzo-level skill requirements for employment stability. Job retention and stability are generally increased although detail about these processes is relatively sparse.

Earlier and protracted intervention appears to offer possibilities. With job supports, individuals generally were more likely to get a job, had higher salaries, and more diverse types of jobs, and were employed longer than controls. For instance, Howlin et al. (2005) report that of the 19 individuals working at the time of an original study in 1999 who were contacted at follow-up (2005), 13 were still employed in permanent jobs; 4 were lost to follow-up, 1 had just reregistered with the program, and 1 was receiving further support from the program. Programming notably included three core elements: employment preparation, job finding tailored to the person with ASD, and workplace support. Workplace support included support to the employee as well as colleagues and supervisors.

McClannahan et al. (2002) reported on a longitudinal study that began implementing intervention programs in childhood and followed participants for 15–25 years. Where individuals were supported long term from childhood to adulthood, training for vocational placements included standard behavioral analysis such as reinforcement procedures, behavior shaping including prompting and fading, and skill generalization. Starting in adolescence, programming focused on vocational skills such as community participation, keyboarding skills, self-care, social interaction, money management, and language development. As young adults, participants became part of the supported employment program, typically serving individuals with mild to moderate cognitive impairment. Findings from this study illuminate benefits from long-term, tailored supported employment programs for persons with ASD, including stable employment and wages, individual satisfaction with work, and employer commitment to employing persons with disabilities.

Garcia-Villamisar and Hughes (2007) studied the effects of a supported employment program for adults with ASD. Adults in the program scored significantly better on more than half of the measures tested, while the unemployed group showed no change in cognitive performance over the duration of the study. These results offer support for the contention that vocational rehabilitation offers promise in potentially increasing cognitive performance for adults with ASD.

The employment support approach emphasizes structured, supported work placements in community settings. In this vocational support modality, the young person is placed in a local organization to work alongside others at the worksite. Individual placement comprises a supported job in the community, and the employee is hired and supervised by the employer, earning similar wages and benefits as fellow employees. Individuals can receive support from staff or from a disability employment support agency. Over time, the goal is for the employee to develop increased independence and for vocational support to taper.

Sheltered work programs differ from this approach in that sheltered workshops tend to place individuals in segregated settings consisting largely only of employees with disabilities. In that model, employees are paid based on their productivity rather than receiving market wages. Better outcomes from supported work models relative to sheltered workshop models have been demonstrated (Garcia-Villamisar et al., 2000; Rusch and Hughes, 1989); hence, there has been a shift away from the sheltered work model in favor of a community placement model.

Supported employment occurs in a variety of service sectors such as food services, hospitality, recycling and delivery, retail, gardening, industrial laundry, and agriculture. Simulation-based training and job coaching appear to enhance learning in the workplace (Lattimore et al., 2006). Of particular importance, supportive employment or job coaching is a specific mechanism that is reported to fulfill a range of roles: to facilitate finding a job, to teach the individual with ASD how to apply and interview for a position, to liaise between an individual with ASD and his or her co-workers or supervisor, to deal with crisis
situations that may arise, and in so doing, to support overall vocational success.

Overall, job coaching emerges as a common and consistently important component of employment support. As an example, a determinant of success in the evaluation of a supported employment program was a close liaison between the employers and the job coaches (Mawhood and Howlin, 1999). The coaches were considered integral to finding employment for the individual with ASD and for providing needed support in the work environment. This close contact allowed for exploring appropriate job opportunities and matching the skills and abilities of a specific employee with a suitable job. The greatest difficulty of job coaching was reported to be the large amount of one-on-one time required of the coach. Yet, this investment of time and effort was deemed necessary, as many individuals with ASD experienced difficulties in both employment seeking and their understanding of the social aspects inherent in work settings.

Technology and media–based support tools

A growing body of literature addresses the application of media and technology to support vocational success for adults with ASD. As an example, the study by Hillier et al. (2007) (also cited above) included a media component using videotaped sessions to support job interview practice. This study entailed comprehensive employment support processes, and hence is listed above, but also utilized media to augment learning and application.

Media and technology are delivered in a variety of forms which are reported to yield distinctive outcomes; some approaches are used for teaching away from the jobsite, while others are implemented onsite. Our review found two studies that specifically cited the use of technology, in the first instance, media use (Allen et al., 2010), and in the second, online application (Burke et al., 2010).

Using media, Allen et al. (2010) explored the use of videotaped modeling of work behaviors as a method to support young adults with ASD. The study focused on three employees (one adolescent and two young adults) who received vocational instruction that featured videotaped demonstrations of skills necessary to conduct work, such as how to promote products in a retail setting while wearing an air-inflated mascot costume. Over a 4-month period, the participants were observed before and after watching a video in which a model performed the various skills of the position. After watching the video, participants were able to correctly use the skills modeled in the video in a work setting. The participants reported that they enjoyed the work, and comments from supervisors were positive.

Another study reported on adolescents with ASD being trained to effectively use personal digital assistant (PDA) tools to prompt them in completing work tasks. Burke et al. (2010) created a performance cue system using PDAs (an adapted iPhone application) and assessed its effectiveness in teaching work-related behaviors. Within this article, two studies were conducted with six young adults with ASD, whereby participants were employed to assist in the delivery of a fire safety training session. They were asked to complete 63 scripted behaviors. In the first study, three participants completed the company’s training program and were exposed to the PDA performance cue system only if it became necessary to meet criteria. The second study involved different participants who accessed only the PDA performance cue system to learn the same work behaviors. A multiple baseline design was used to measure the efficacy of the program for each participant over time. Results showed that five of the six participants achieved the desired work behaviors only after the introduction of the performance cue system. Accordingly, such technology-based cuing may support complex task learning by breaking down tasks into discrete steps seen on the iPhone or other PDAs.

Discussion

These studies offer provisional guidance for vocational support to individuals with ASD; however, as indicated in a previous review (Louds Taylor et al., 2012), this body of literature must be viewed with caution due to its volume and design issues. Yet existing studies generally demonstrate positive outcomes from a range of vocational support approaches using supported employment with augmentation from job coaching, media, and/or technology. The use of job coaches demonstrates emerging promise and is worthy of further study. Youth- and adult-based training in interpersonal communication and job skills, along with lingering support, emerged as compelling components of vocational preparedness and ultimate stability.

Existing studies generally are limited by small sample size and imprecise measurement of outcomes. Given these challenges and the relative absence of replication data (other than for one program, i.e. Howlin et al., 2005), there are concerns about the generalizability of these findings. One supported employment program had long-term follow-up data, which serve as replication of the same vocational support model over time (Howlin et al., 2005; Mawhood and Howlin, 1999). Among the studies that had a comparison group, few had used experimental methods to randomize participants into the treatment and comparison arms. Stronger research designs would offer greater evidence for the effectiveness of vocational supports across settings and ASD cohorts, particularly critical given the heterogeneity of ASD. Only one study directly compared different interventions in the same study (Garcia-Villamisar et al., 2000); hence, further comparative work is needed. Notwithstanding these concerns, the inclusion of these studies beyond stricter systematic review criteria
seems advantageous until more literature with stronger designs are available.

Of note, studies generally focus on individuals with higher cognitive skills. While we acknowledge this as a gap, hence the need for broader-based samples that span the heterogeneity of ASD, we also recognize that service providers are encountering increasing numbers of individuals without cognitive impairment yet with core ASD symptoms that impair their vocational pathway. The employment support needs of this emerging cohort—perhaps individuals who have never received a formal diagnosis—present unmet challenges for the ASD community (Stoddart et al., 2011).

Barriers to the vocational success of people with ASD yield substantial costs to the individual with ASD, their family, and society at large (Cimera and Cowan, 2009; Howlin et al., 2005). For individuals with ASD, the contribution of employment to the development of their adult identity is obviously compromised for those who cannot find or retain a job or are underemployed (Hendricks, 2010). Moreover, work potentially provides a wage and less dependence on social welfare, but often also offers additional links to personal identity, friendship, self-esteem, and quality of life. Given the social challenges of many persons with ASD, having a job can be an important mediator to relationship formation and social identity. Generally, it appears that successful, meaningful, and sustainable vocational activity may be substantially important to self-esteem, identity development, and asset generation (Hillier et al., 2007). Despite the inherent value of working, the ASD literature is yet relatively limited in terms of examining personal meaning and quality of life associated with vocational success.

From a community and social perspective, substantial losses to social capital are incurred by not employing—or fully employing—individuals with ASD (Howlin et al., 2005). Financial losses further arise if caregiving family members are forced to end or decrease their own employment in order to provide daily care and/or accompaniment for their unemployed adult son or daughter with ASD (Järbrink et al., 2007). Without effective vocational supports for adults with ASD, this level of hands-on family care may be needed for many years, and reliance on family members and other forms of income supports, such as government-based social service systems can unnecessarily become extended and potentially drain family resources.

**Emerging principles of vocational support**

Reviewed studies address employment support, job coaching, and technology and media application. Although underdeveloped, the literature cumulatively offers provisional guidance. For instance, supported employment appears to offer promise, particularly when reflecting elements of job coaching. In considering ways to support community engagement, sheltered workshop environments seemingly yield less benefit relative to community-integrated supported employment approaches. Along with supported environments, community embeddedness emerged as a value that appears to have been upheld over time. Accordingly, supported employment entails targeted, individualized support based on the employee/employer relationship that is embedded in a resourced and nurturing community.

Notions of vocational “fit,” preparedness, and support, as needed, appear to be reflective of vocational success for individuals with ASD and their employers. Emerging research thus appears to position vocational support as training and support for the individual with ASD, on the one hand, yet also assistance to the employer (and potentially work colleagues) on the other. In this relational, educational, and supportive model, the literature demonstrates emerging benefits from job coaching, with technology-based applications receiving substantially less attention in the peer-reviewed literature.

**Future directions**

Notwithstanding advances in our understanding of vocational issues in ASD, much remains unknown (Taylor et al., 2012). Future studies are needed that assess the role of peer relationships in fostering vocational success, and how employment or other vocational activity has a bearing on the development of personal identity, self-esteem, social opportunity, and other outcomes for adults with ASD. A range of approaches for delivering vocational support is likely needed given the diversity of ASD presentation and individual interests and skills. Moreover, vocational needs are likely to change over time given individual maturation, shifts in family life circumstances, career pathways, and other personal, family, and contextual influences. Model development that accommodates such diversity is needed, as is fine-grained analysis that identifies elements promoting vocational outcome. Furthermore, areas for research development include challenges and opportunities for human resource departments, unions, hiring and support policy, and long-term impacts resulting from vocational innovation. There is a marked gap in work with employers as the literature generally has focused on employee support. Engaging employer needs in hiring persons with disabilities seems critical in proactively addressing the labor market and demand side of vocational advancement.

Finally, service delivery and vocational support resources typically include a range of disabilities. More broadly, drawing on strategies across diagnostic categories may yield greater traction in motivating practice, and policy and attitude shifts relative to increased vocational opportunity. Drawing on learnings and successes from the vocational advancement of other disability groups (Dutta
et al., 2008; Stumbo et al., 2009) and among other marginalized populations (Diemer and Blustein, 2007) may offer insights and strategies in moving forward.

Review limitations
There are several limitations of this review. First, a systematic review would have yielded stronger evidence; however, this was not conducted due to the relative dearth of study volume and rigor. Identifying conceptual understanding within the literature seemed more plausible and productive in that systematically excluding less rigorous studies on the basis of narrow criteria risked eliminating the majority of relevant information.

A strength of the critical interpretive synthesis approach is reflected in its accommodation of both quantitative and qualitative studies. While this flexibility is appealing in distilling disparate designs and types of data, the resulting lack of methodological standardization in review hinders the use of common metrics for the analysis of outcomes, and limits quality-based determinants for study inclusion and description. Notwithstanding these limitations, the focus on conceptual development offers a general understanding of existing studies, and, in this case, corroborates earlier calls for future focused research.

Conclusion
While the ASD vocational literature offers helpful knowledge at this early phase of its development, further study is needed to ensure stable, welcoming vocational communities in which individuals with ASD can enjoy meaningful work and optimal quality of life. The reviewed studies provide a backdrop for vocational scholarship in ASD, and cumulatively offer an emerging “test of concept” of current vocational approaches for persons with ASD.

Funding
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References


### Table 2. Supported employment.

<table>
<thead>
<tr>
<th>Author</th>
<th>Aims</th>
<th>Methods</th>
<th>Sample</th>
<th>Intervenional approach</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mawhood and Howlin (1999)</td>
<td>Examined the outcomes of a vocational training program offering supported employment for adults with autism.</td>
<td>Intervention study using a field study design; pre/post intervention data collection.</td>
<td>30 adults with ASD in the intervention group, and 20 in a comparison group that was matched by age, level of intelligence, and education.</td>
<td>Job coaching provided with gradually decreasing level of support over time.</td>
<td>Individuals in the intervention group were more likely to get a job, had higher salaries and job types, and were employed longer than controls.</td>
</tr>
<tr>
<td>2. Howlin et al. (2005)</td>
<td>Longitudinal follow-up of the program described in Mawhood and Howlin (1999).</td>
<td>Program evaluation using outcome metrics used above by Mawhood and Howlin (1999).</td>
<td>117 adults with ASD.</td>
<td>Follow-up with adult service users with ASD over an 8 year period. Programming included three core elements: employment preparation, job finding tailored to the person with ASD, and workplace support. Workplace support included support to the employee as well as colleagues and supervisors.</td>
<td>The program’s early level of success in finding employment for clients had been maintained over the following eight years, including wage increases and permanent contracts.</td>
</tr>
<tr>
<td>3. McClannahan et al. (2002)</td>
<td>Evaluated the long-term effectiveness of a behavioral intervention program.</td>
<td>Longitudinal study examining employment outcomes.</td>
<td>15 participants with ASD ranging from 4 to 10 years of age at the onset of the intervention and from 21 to 35 years of age at the time of follow-up.</td>
<td>Participants were followed for 15–25 years and received instruction in the home and community settings, including supported employment.</td>
<td>11 participants eventually found a job, with 4 in full-time positions and 7 in part-time positions. On a seven-point Likert scale, with seven representing complete satisfaction with the program, the average score by users was 6.9, suggesting very strong satisfaction with program services. Their employers also provided satisfaction ratings at a similarly high level for the program overall, and indicated interest in participating in future supported employment opportunities.</td>
</tr>
<tr>
<td>4. Garcia-Villamisar and Hughes (2007)</td>
<td>Examined executive functioning-related outcomes for adults with ASD in a supported employment group versus those who were unemployed.</td>
<td>Intervention study using a field study design; pre/post intervention data collection.</td>
<td>44 adults with ASD; number of participants in experimental versus control groups not indicated.</td>
<td>Participants in the supported employment group worked primarily in the service sector at a competitive wage. Each was assigned a job coach who provided ongoing support in the integrated work setting.</td>
<td>Adults in supported employment demonstrated improved scores on more than half of the measures tested regarding executive function such as memory, strategy, planning, and problem solving, while the unemployed group showed no change in cognitive performance over the duration of the study.</td>
</tr>
<tr>
<td>5. Lawer et al. (2009)</td>
<td>Examined the experiences of adults with ASD in the US Vocational Rehabilitation System (VRS).</td>
<td>Routine data-based study using case control design.</td>
<td>Out of an initial pool of 382,221 individuals aged 18–65 years served by the VRS system whose cases had closed in 2005, 1707 were included in the study sample as they had an ASD diagnosis. This sample was comprised of 84% males, with participants ranging from 18–65 years old. Nearly 56% of this sample was not employed.</td>
<td>Using the VRS as a repository of information, researchers examined individuals’ access to services, cost of services, and employment status.</td>
<td>Results indicated that adults with ASD were more likely to be denied service because of the severity of their disability, and that more money for rehabilitation services was spent on individuals with ASD than those with other impairments. Competitive employment rates for individuals with ASD did not differ from those with other impairments. Of particular note, however, post hoc analysis findings indicated that, “successful competitive employment for people with ASD … may depend on the presence of on-the-job supports” (Lawer et al., 2009: 493).</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>Author</th>
<th>Aims</th>
<th>Methods</th>
<th>Sample</th>
<th>Interventional approach</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garcia-Villamisar et al. (2000)</td>
<td>Examined sheltered employment and supported employment.</td>
<td>Intervention study using a field study design; pre/post intervention data collection.</td>
<td>51 young adults with ASD with a mean age of ~21 years; 21 participants in the supported employment group.</td>
<td>Models of employment were compared. Participants were divided into two groups that were matched on age, intelligence level, and ASD severity.</td>
<td>Participants in the sheltered employment group had autism severity scores that increased over time, whereas the scores of the supported work group remained stable over the three year intervention timeframe. Integrated employment in the community is recommended. Outcomes related to employment stability, work performance, and wages were not reported.</td>
</tr>
<tr>
<td>Lattimore et al. (2006)</td>
<td>Examined the use of supported work training at community-based job sites in combination with simulation-based training. This enhanced training condition was compared against only jobsite training without simulation for its impact on the acquisition of new work skills.</td>
<td>Single case, multiple baseline design across participants; task analysis with and without simulation training.</td>
<td>4 participants with ASD ranging from 29 to 40 years of age.</td>
<td>Implemented a simulation that replicates the work environment as much as possible and taught relevant skills in this replicated environment as well as at the jobsite.</td>
<td>Results showed that on three of the four measures examined, adults with ASD were able to acquire work skills more quickly when onsite jobsite training was augmented by simulation training.</td>
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<tr>
<td>Hillier et al. (2007)</td>
<td>Evaluated the impact of a vocational support program on employment rates and income.</td>
<td>Longitudinal study examining employment outcomes.</td>
<td>Nine participants with ASD, of which five were still attending high school and four had recently graduated from high school. Seven of the participants had an IQ in the normal range, and two participants were not able to complete an IQ measure due to low verbal skills.</td>
<td>Participants and their parents completed interviews regarding participant strengths and challenges. Participants then received pre-placement services, such as how to conduct a job search, develop a resume, complete a job application, and navigate a job interview. They completed videotaped practice interviews, from which they received feedback on ways to improve skills. Once a job was found, a program coordinator initially visited the site to evaluate the environment and assess for potential supports needed for job success. Upon starting the job, the coordinator also provided onsite job coaching, which was gradually weaned, but could be reactivated as needed.</td>
<td>Employment rates and income increased for the participants after the introduction of a job coach. Employers rated the job performance of program participants positively and the employees indicated high job satisfaction. However, most participants reportedly were not sufficiently prepared for work prior to enrollment in the program and thus they had unrealistic expectations of what the job entailed. Participants encountered difficulty in social aspects of working, including communication with supervisors and co-workers.</td>
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</table>
### Table 2. (Continued)

<table>
<thead>
<tr>
<th>Author</th>
<th>Aims</th>
<th>Methods</th>
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<tr>
<td>9. Allen et al. (2010)</td>
<td>Explored the use of videotaped modeling of work behaviors as a method to support young adults with ASD.</td>
<td>Single case, multiple baseline design across participants to evaluate intervention.</td>
<td>3 employees with ASD, one adolescent and two young adults, ranging from 17 to 22 years of age.</td>
<td>Participants received vocational instruction that featured videotaped demonstrations of skills necessary to conduct work, such as how to promote products in a retail setting while wearing an air-inflated mascot costume. Over a four-month period, the participants were observed before and after watching a video in which a model performed the various skills in the costume in both scripted and naturalistic scenes.</td>
<td>All participants learned the required skills in combination and proper sequence after watching the video model. The skills learned from the video instruction process generalized to an actual paid job opportunity in which they wore the inflated suit for promotional activity. The participants reported that they enjoyed the work, and comments from supervisors were positive.</td>
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<td>10. Burke et al. (2010)</td>
<td>Examined the use of personal digital assistant tools (PDAs) (an adapted iPhone application) to prompt students in completing work tasks.</td>
<td>Single case, multiple baseline design across participants to evaluate intervention.</td>
<td>6 adults with ASD ranging from 18 to 27 years of age.</td>
<td>Developed and tested a performance cue system using PDAs for teaching work-related behaviors. Within this article, two studies were conducted, whereby participants were employed to assist in the delivery of a fire safety training session. In the first study, three participants completed the company’s training program and were exposed to the PDA performance cue system only if it became necessary to meet criteria. The second study involved different participants who accessed only the PDA performance cue system to learn the same work behaviors.</td>
<td>5 of the 6 participants achieved the desired work behaviors only after the introduction of the performance cue system.</td>
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