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Adult Employment Assistance Services for Persons with Autism Spectrum Disorders: Effects on Employment Outcomes

John D. Westbrook, Chad Nye, Carlton J. Fong, Judith T. Wan, Tara Cortopassi, Frank H. Martin



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Executive summary/Abstract

BACKGROUND

The incidence of Autism Spectrum Disorders (ASD) has been increasing over the last two decades. Currently, 1 in 110 children are identified with ASD in the United States (CDC, 2009). ASD refers to a range of neurological disorders that involve some degree of difficulty with communication and interpersonal relationships. The range of the spectrum for autism disorders is wide with those at the higher functioning end often able to lead relatively independent lives and complete academic programs even while demonstrating social awkwardness. Those at the lower functioning end of the autism spectrum often demonstrate physical limitations, may lack speech, and have the inability to relate socially with others.

As persons with ASD age, options such as employment become increasingly important as a consideration for long-term personal planning and quality of life. While many challenges exist for persons with ASD in obtaining and maintaining employment, some research is showing that, with effective behavioral and social interventions, employment can occur (Schaller & Yang, 2005). In fact, about 37% of individuals with ASD report having been employed for 12 months or more, four years after exiting high school (Newman, Wagner, Cameto, & Knokey, 2009). However, several studies show that individuals with ASD are more likely to lose their employment for behavioral and social interaction problems rather than their inability to perform assigned work tasks (Dew & Alan, 2007; Hurlbutt & Chalmers, 2004; Unger, 1999).

Research has been conducted in the area of autism and employment, but such research has not been reported in a comprehensive evidence review format before. Thus, a systematic review on the effectiveness of adult employment assistance interventions for individuals with ASD would not only demonstrate the extent and magnitude of the interventions' effects, but also provide ideas for further research that can inform implementation and refinement of related employment-focused programs.

OBJECTIVE

The objective of this review is to determine the effectiveness of adult employment interventions in securing and maintaining employment for adults with ASD.

SEARCH STRATEGY

The comprehensive search strategy used to identify relevant studies included the review of 28 relevant electronic databases. Search terminology for each of the electronic databases was developed from available database thesauri. Appropriate synonyms were used to maximize the database search output. Several international databases were included among the 28 databases searched.

In addition, the authors identified and reviewed grey literature through analysis of reference lists of relevant studies. Unpublished dissertations and theses were also identified through database searches. The programs of conferences held by associations and organizations relevant to ASD and employment were also searched.

SELECTION CRITERIA

A two-stage process was used to determine inclusion or exclusion of studies: (1) two reviewers independently reviewed the title and abstract of each identified study, and (2) for studies advanced from the first stage, two independent reviewers reviewed the full text of each study for final determination of inclusion or exclusion. Inclusion criteria allowed the following research designs: randomized controlled, quasi-experimental, and single subject experimental designs.

DATA COLLECTION AND ANALYSIS

The electronic searches of databases yielded 8,528 citations for the first stage of review. Of these, a total of 77 citations were selected for second stage full-text review of each study. Upon review of the full-text for each of the 77 studies, two studies were retained, having met the inclusion criteria.

Of the two included studies, both were quasi-experimental research designs. The studies generally described the effects of a supported employment intervention for adults with ASD on either employment outcomes or aspects of cognitive functioning. The nature of the data provided did not lend itself to a traditional meta-analysis. Given the number of studies, study designs, and the diversity of outcomes across the two studies, it was not possible to aggregate results across studies.

RESULTS

This review was not able to identify definitive interventions that predictably and positively supported the development of employment outcomes for individuals with ASD.

There were two included studies. One, Mawhood and Howlin (1999), described outcomes directly related to employment by comparing an experimental group ($n = 30$) who received guidance from a support worker in the form of job finding, work preparation, and communication with the employers with a control group ($n = 20$) that did not receive any support. At the end of the two-year study period, the authors found that the experimental group demonstrated significantly higher rates of having found paid employment ($d = 1.067$, 95% CI = 0.123 to 2.010), significantly longer periods of working time ($d = 0.684$, 95% CI = 0.111 to 1.257), and significantly higher wages ($d = 1.177$, 95% CI = 0.169 to 0.819). The experimental group also worked more hours per work week ($d = 0.328$, 95% CI = -0.628 to 1.284), but this effect was not significant.

The second included study, Garcia-Villamizar, Ross, and Wehman (2000), described differential effects of supported employment and sheltered employment for persons with autism. The experimental group received supported employment, i.e., jobs working between 15 and 30 hours per week in their communities and received job coach support services. The control group received sheltered employment, i.e., jobs that were not in their communities and with no job coaching services. Using measures of the Childhood Autism Rating Scale (CARS), the supported employment group was not significantly different from the sheltered employment group after treatment ($d = -0.229$, 95% CI = -0.764 to 0.306). The study did not report any differences in employment acquisition or maintenance between the two groups.

In an analysis of risk bias of the included studies, it was found that there was a high level of substantial potential for bias across three of the five sources of bias analyzed including unit of assignment, unit of analysis, attrition, fidelity of implementation, and blinding. The methodological quality of both included studies was low. Therefore, these review results should not be interpreted as indicating definitive results related to the development of employment outcomes for persons with ASD.

AUTHORS' CONCLUSIONS

Qualitative and other relevant research studies connected to the employment of persons with ASD were also reviewed and suggest that the following may be elements of successful employment placement for persons with ASD: (1) identification of the most appropriate work settings and placements, (2) provision of effective supports on the job,

(3) need for long-term support services for the employer and the consumer, (4) costs for support, and (5) positive effects of employment on persons with ASD. While qualitative studies point to a number of promising issues for future research, they do not provide a definitive statement about what works.

In addition, the authors noted that costs for community-based employment interventions such as those included in this review are more expensive than other employment alternatives such as sheltered non-integrated workshops. However, Howlin, Alcock & Burkin (2005) and others (e.g., Cimera & Cowan, 2009) show that supported employment service interventions, such as those identified in our included studies, are becoming less expensive to deliver. It seems important to note that community-based integrated employment interventions, while expensive, do expand options for mainstream social integration, competitive wages, and community involvement.

1 Background

The first paper identifying a condition called autism was published in 1943 (Kanner, 1943). Today, the condition is referred to as autism spectrum disorders (ASD) and refers to a range of mild to severe forms of neurological disorders marked by impairment in social functioning, communication, and repetitive and unusual patterns of behavior.

According to the Centers for Disease Control and Prevention (CDC), the rate of autism has increased over the past two decades to 1 in 110 children currently being identified with autism spectrum disorder (CDC, 2009). More recently, research indicated rates as high as 2.64% of individuals with ASD in the population (Kim et al., 2011). Functional limitations caused by ASD continue into adulthood and often create barriers to independent living and stable long-term employment (Autism Society of America, 2008).

ASD refers to a range of neurological disorders that involve some degree of difficulty with communication and interpersonal relationships, as well as obsessive and repetitive behaviors. ASD occurs in all racial, ethnic, and socioeconomic groups. There is a wide range of effects demonstrated across the spectrum. Those at the lower functioning end of the spectrum often demonstrate physical limitations and may not be able to speak or relate socially to others. Those at the higher functioning end of the spectrum are often able to lead relatively independent lives, graduate from academic institutions, but may also be awkward in their social interactions and have difficulty developing friendships. Some less frequent disorders such as Rett Syndrome affect mostly girls, while Childhood Disintegrative Disorder affects mostly boys; in both cases, there is a period of normal development before the onset of severe autistic and other health-related symptoms. Men manifest ASD at a rate four to five times higher than women. The significant gap represented from the high to the low end of the spectrum dramatically affects employment-related skills, abilities, and behaviors (Centers for Disease Control and Prevention, 2011).

Given the increase of ASD prevalence and the number of students with ASD exiting public school settings, attention is increasingly focused on potential employment outcomes for individuals with ASD. Individuals without severe disabilities are eight

times more likely to be employed than individuals with very severe disabilities (National Organization on Disability, 2000). Individuals with ASD are among those least likely to be employed (Cameto, Marder, Wagner, & Cardoso, 2003; Dew & Alan, 2007); in fact, only 15% of individuals diagnosed with ASD in the United States gained employment (Cameto, Marder, Wagner, & Cardoso, 2005).

Although economic conditions and employer attitudes affect employment opportunities, employment outcomes for individuals with ASD can be improved by appropriately addressing specific behaviors common among individuals with ASD (Schaller & Yang, 2005). Several studies have indicated that individuals with ASD are more likely to lose their employment for behavioral and social interaction reasons rather than their inability to perform work tasks (Dew & Alan, 2007; Hurlbutt & Chalmers, 2004; Unger, 1999). Behavior management challenges affecting employment must be understood and addressed consistently by employment support service providers in order to effectively facilitate obtaining and maintaining employment by individuals with ASD. However, relatively few employment support service providers including state vocational rehabilitation counselors have an in-depth understanding of services that are associated with developing successful employment outcomes for individuals with ASD (Dew & Alan, 2007).

Each state in the United States has at least one state agency that is charged with the provision of vocational rehabilitation services to facilitate employment outcomes for eligible individuals with disabilities. Data accumulated through the national network of state vocational rehabilitation agencies suggest that few individuals with autism were requesting services and of those that do most were not successfully employed as an outcome of the service. However, in its latest report, the National Vocational Rehabilitation Service System indicated that in fiscal year 2007 it provided services that successfully placed 1,774 individuals with ASD into employment situations that continued for 90 or more days (Rehabilitation Services Administration, 2009).

1.1 CONTRIBUTION OF THE REVIEW

Research has been conducted in the area of autism and employment, but such research has not been reported in a comprehensive evidence review format before. Thus, a systematic review on the effectiveness of adult employment assistance interventions for individuals with ASD would not only demonstrate the extent and magnitude of the interventions' effects, but also provide ideas for further research that can inform implementation and refinement of related employment-focused programs.

More needs to be known about strategies that are successful in developing and maintaining employment outcomes by individuals with ASD. As the population of individuals with ASD grows, enhanced awareness of effective approaches is likely to

increase the availability of more effective employment support services, such as job development and tailoring, job coaching, vocational rehabilitation, and supported employment. A glossary to assist readers in understanding the differences in terminology related to different types of employment outcomes and job support interventions is provided in Appendix A: Potential Job Supports and Interventions Glossary. The present review of studies on adult employment assistance interventions for individuals with ASD will produce a synthesis of the intervention impact as well as highlight the gaps in experimental research in this area.

2 Objectives

To determine the effectiveness of adult employment assistance in securing and maintaining employment for adults (18 years and older) with autism spectrum disorders (ASD).

3 Methods

3.1 CRITERIA FOR INCLUSION AND EXCLUSION OF STUDIES IN THE REVIEW

A two-stage process was used to determine inclusion or exclusion of studies: (1) title and abstract stage and (2) full text stage.

3.1.1 Title and Abstract Stage

Studies were assessed and selected for advancement to the next stage of inclusion if evaluation meets at least one of the two following criteria:

3.1.1.1 *Participants*

The participant sample of study included only adults 18 years or older with a diagnosis of ASD, who were no longer enrolled in a school-to-work program or secondary-level education program. The review was designed to identify effective interventions that could be implemented by adult service program agencies; therefore, secondary school and other employment programs conducted in school settings with students were excluded. The authors are conducting another systematic review focusing on the effectiveness of employment assistance interventions for transition-age youth with ASD currently enrolled in an educational setting context.

3.1.1.2 *Intervention*

The focus of the study intervention centered on the topic of employment. The types of employment included were competitive, supported, or integrated employment. Studies in which the experimental groups assigned to sheltered work or non-integrated work interventions were excluded from the review due to not providing the integrated or mainstream format of employment. Studies that reported effect sizes were included in the review.

If these criteria were not clear from the title or abstract, the study was advanced for retrieval of the full text to determine eligibility.

3.1.2 Full-Text Stage

Full-texts of studies from all citations/abstracts advanced from Stage 1 were retrieved for a final determination of inclusion in the review and analysis. All of the following criteria were required for each study in order to be included in the review and analysis.

3.1.2.1 Research Design

Studies used an experimental or randomized controlled trial design (RCT), quasi-experimental design (QED), or single subject experimental design (SSED) to report the effects of the intervention.

3.1.2.2 Participants

The recipients of the intervention were individuals with an ASD, 18 years of age or older and were voluntarily seeking assistance in obtaining employment. Study participants with ASD eligible for inclusion were individuals with Asperger Syndrome, Autism, Rhett Syndrome, Childhood Disintegrative Disorder, or Pervasive Developmental Disorder-Not Otherwise Specified, as defined in the DSM-IV-TR and diagnosed by an appropriate professional.

Participants not employed at the time of the study intervention were the focus of this review. Reviewers did not exclude studies in which the participant pool included both participants who had an employment history and those who did not. Individuals who were employed prior to an intervention study were not excluded in this review.

Study participants with ASD and other secondary disabilities were included; however, study participants with sole disabilities such as mental retardation, schizophrenia, attention deficits or other non-autism related conditions were not included.

3.1.2.3 Intervention

The interventions were required to provide adult employment assistance intended to produce employment outcomes for individuals with ASD. The interventions needed to address social, behavioral, and/or cognitive dimensions related to the acquisition and maintenance of employment among the study participants were reviewed. The interventions also needed to involve relatively specific and structured experiences designed to support employment placement: for example, providing guidance in completion of applications, resumes, and engaging in interviews; shaping of work skills and appropriate employment setting social skills; employment site supports; designing of jobs/tasks around the expressed needs and desires of participants; teaching of work-related communication skills; or working directly with employers in the structuring of work and work setting features for individuals with ASD.

3.1.2.4 Outcome Measures

Eligible outcomes included subsequent attainment of an employment placement and specific data about the duration and/or retention of that placement must have been provided. Gainful employment included competitive, integrated, or supported employment. Sheltered work or non-integrated work was not considered as an outcome measure for this review. Employment encompassed full or part-time placements. Employment assistance interventions of any length duration were included provided adequate description was provided by the authors of the study. See Appendix A: Potential Job Supports and Interventions Glossary for more information about job supports and interventions.

3.1.2.5 Publication Status

Published and unpublished studies were eligible for inclusion in the evidence pool.

3.1.2.6 Country of Origin and Language of Publication

Studies that were conducted in any country were eligible. We did not exclude studies reported in languages other than English, but we did not specifically search for non-English literature; however, we did search selected international databases. Non-English studies that were retrieved or reviewed required the reviewers to obtain assistance from native speakers.

3.2 SEARCH STRATEGY FOR IDENTIFICATION OF RELEVANT STUDIES

The search strategy used for identification of relevant studies is highlighted below.

3.2.1 Electronic Searches

Studies were identified using electronic search techniques of 28 computerized databases. We consulted database thesauri, where they were available to assure that the universe of appropriate synonyms had been included in the intervention and outcome search term categories. Search terms and search strategies were modified to fit individual databases.

Databases searched included:

- a. PubMed/MEDLINE
- b. NARIC REHABDATA
- c. ERIC
- d. CIRRIE (Center for International Rehabilitation Research Information and Exchange Database)
- e. PsycINFO
- f. ARD (Autism Research Database)

- g. Sage Family Studies Abstracts
- h. Dissertation Abstracts International
- i. Cochrane Central Registry of Controlled Trials
- j. British Education Index
- k. Canadian Research Index
- l. Australia Education Index
- m. CBCA Education
- n. Sociological Abstracts
- o. Academic Search Complete
- p. CINAHL Plus with Full Text
- q. Professional Development Collection
- r. PsycCRITIQUES
- s. PsycEXTRA
- t. Psychology and Behavioral Sciences Collection
- u. Web of Science
- v. Academic One File
- w. WorldCat [for monographs]
- x. FRANCIS
- y. ABI Inform Global
- z. Science and Technology Collection
- aa. PsycARTICLES
- bb. Business Source Complete

3.2.2 Search Terms

The keywords used in the computerized bibliography searches were divided into three categories: population, treatment, and domain. The searches covered the period from 1943 through 2008. All search terms were truncated using the DIALOG Database conventions in order to include variations in endings of words and in spelling. Terms from the three categories were connected with “or” within each category and connected with “and” between categories.

POPULATION

- autis?
- childhood(w)disintegrative(w)disorder?
- pervasive(w)developmental(w)disorder?
- pervasive(w)developmental(w)disorder(w)not(w)otherwise(w)specified?
- spectrum(w)disorder?
- Asperger?

TREATMENT

- treatment?
- intervention?
- model?
- program?
- practice?
- instruction?
- training?
- service?
- supported employ?

DOMAIN

- employ?
- adult?
- rehabilitation?
- vocational?
- workplace?

For more information on the search strategy, see Appendix B: Documentation of Search Strategies for the Systematic Review.

3.2.3 International Contacts

Our efforts to find studies from outside the United States included searching in several non-United States and international databases. This did yield studies that were reviewed in Stage One review procedures. Recent reviews on autism research outside the U.S. were reviewed to provide additional relevant research studies.

3.2.4 Grey Literature

Grey literature identified through electronic searches was submitted to the same inclusion criteria as other studies. The same time range (1943 - 2008) for grey literature types of studies was specified as the other studies. References from individual studies were searched for potential studies to consider for inclusion. In addition, unpublished dissertations and theses were identified through the search strategy for review and consideration. Also, recent (2010-2011) conference proceedings from relevant associations and conferences were reviewed to identify unpublished studies to include in the review.

3.2.5 Cross-referencing of Bibliographies

The references in relevant journal articles and other reports of research results were scanned for new additions for the review.

3.2.6 Conference Programs

Recent conference programs and conference syntheses were reviewed for leads about eligible literature for review. Professional organizations/events that were reviewed included:

- Autism Society of America
- National Association of Rehabilitation Research and Training Centers
- International Society for Autism Research
- National Alliance for Autism Research
- Autism Research Institute
- National Autistic Society (UK)
- Autism Research Centre (Cambridge)

Conference proceedings that were reviewed included:

- Asia Pacific Autism Conference 2009
- PENN Autism Network Conference.
- Autism Society National Conference
- NARRTC Annual Conference
- Annual International Meeting of Autism Research (IMFAR)
- National Autistic Society's Professional Conference
- Cambridge Autism Research Conference

3.3 CODING PROCEDURES AND CATEGORIES

Studies were screened for inclusion/exclusion decisions at two stages, Stage 1: citation and abstract and Stage 2: full-text. The same two coders served as independent reviewers at both stages. A third party was not needed to resolve a coding value difference.

3.3.1 Citation and Abstract Stage

At Stage 1, the decision for advancing the retrieved citations and abstracts to the full text stage retrieval was made independently by both reviewers based on meeting two items from a, b, and c of the following questions or a designation by a reviewer of 'unsure' (item d):

- a. Are the participants identified, described, and defined under the Autism Spectrum Disorder category?
- b. Are the participants 18 years of age or older? Are the participants no longer enrolled in a school-to-work transition program or secondary-level education/program?
- c. Is this abstract/citation about employment?
- d. Unsure of meeting inclusion criteria?

If the reviewers were 'unsure', the citation/abstract was advanced to the Full-Text stage for a final inclusion decision. Inter-rater reliability was tested on a sample of 25 studies at this stage and was found to be 95%. Coding differences were resolved through discussion between the two reviewers.

3.3.2 Full-Text Level

At the Full-Text Stage 2 level, full texts of all citations advanced from Stage 1 were obtained and coded for an inclusion/exclusion decision. The decision for advancing the retrieved full-text studies to an inclusion status was made by two reviewers for each study, independently evaluating each study. An inclusion decision for advancement to the coding stage of the process required that a study met all the criteria presented earlier. Inter-rater reliability was established prior to initiating coding activities, minimizing coding disagreements. When differences did arise, resolution occurred through discussion and agreement of the two reviewers.

At the Full-Text Stage 2 level, the two reviewers recorded all excluded studies and the reason for exclusion independently. For more information see Appendix D: Reasons Stage 2 Studies were Excluded from the Systematic Review.

When multiple studies used the same sample or outcome data, the study providing the most complete information focusing on our desired intervention outcome was selected for inclusion.

3.4 ASSESSMENT OF METHODOLOGICAL QUALITY

Included studies were coded by two independent reviewers for methodological quality addressing dimensions that included:

- Design type
 - RCT Individual Randomized Design
 - RCT Group Randomized Design
 - Quasi-Experiment: Equivalent Comparison Design (individuals)
 - Quasi-Experiment: Equivalent Comparison Design (groups)
 - Quasi-Experiment: Nonequivalent Comparison Design (individuals)

- Quasi-Experiment: Nonequivalent Comparison Design (groups)
- Quasi-Experiment: Regression Discontinuity
- Single Group Quasi-Experiment: Interrupted Time Series Design
- Single Group Pretest/Posttest design
- ABAB Single Subject Design
- MBL Single Subject Design
- Survey: Cross Sectional
- Survey: Longitudinal
- Unit of assignment (e.g., individual vs. group/class)
- Unit of analysis (e.g., Intention to Treat, Test only, Treated)
- Attrition from pretest to posttest
- Fidelity of implementation (e.g., following replicable program of intervention)
- Blinding of assessors/interventionists

Other data that were extracted and coded from the primary studies included: publication source, subject characteristics, sample source, employment setting, intervention characteristics, type of employment, and outcome measurement. See Appendix C for a copy of the coding form.

In addition, an evaluation of the potential risk of bias of all included studies was conducted using “Risk of Bias” procedures developed by Higgins and Green (2011) in which studies are evaluated across five sources of potential bias. A report of this analysis is provided in the Results section.

3.5 CALCULATING EFFECT SIZES

The magnitude of the intervention effect was to be calculated using the commonly accepted statistical formulae and dedicated programs available. The characteristics of the studies included in the final pool, however, did not allow the reviewers to calculate and integrate effect sizes. Specifically, all effect size calculations were conducted using Comprehensive Meta-Analysis (CMA) (Borenstein, Hedges, Higgins, & Rothstein, 2005) using the standardized mean difference statistic d as the measure of treatment effect. Effect sizes were calculated directly from reported means and standard deviations for the experimental and control groups for studies that reported such statistics. For studies that reported statistics such as t , F , or p values and the accompanying sample sizes only, conversion formulae were provided by CMA to calculate the d -index for the effect size estimate. In addition, all effect size intervals were calculated using a 95% confidence interval as provided by the CMA software.

The outcomes reported in the studies included in the final pool, however, did not allow the reviewers to synthesize the effect size estimates due to the lack of common outcomes across the included studies.

4 Results

4.1 INFORMATION RETRIEVAL

The combined electronic and hand searches produced a total of 8,528 citations at Stage 1 Abstract/Citation. Of these studies a total of 77 citations were advanced for collection of a full text copy of the study (Full-Text Stage 2).

Upon review of the full-text for each of the 77 studies, two studies were retained for having met all inclusion criteria described earlier. A list of the excluded studies and the reasons for exclusion are presented in Appendix D. Studies that did not describe or assess an intervention ($n = 49$), did not present employment-related outcomes ($n = 9$), did not contain participants with ASD ($n = 5$), did not meet age or out-of-school criteria ($n = 4$), did not provide quantitative data ($n = 4$), or did not include a comparison group ($n = 1$) were excluded.

One author (M.D. Smith) was contacted regarding several full text studies that were not available to the reviewers. Smith was not able to provide the full text versions but did suggest an alternative study that was accessed and subsequently excluded.

4.2 PUBLICATION BIAS

The authors reviewed unpublished dissertations and theses that were identified through the review's search strategies. In addition, bibliographies of relevant studies were reviewed to identify additional studies that may not have been identified through the database searches. Recent conference proceedings of relevant professional associations and disability-related organizations were reviewed for relevant studies that may not have been published. While these steps added studies to the review process, they did not result in additional included studies.

The authors searched widely for relevant literature. In the authors' opinion, no publication bias exists in the conduct of this systematic review. It is apparent that very limited rigorous research literature currently exists that is directly related to our review question.

4.3 STUDY SUMMARY AND DATA ANALYSIS

In general, the two included studies described the effects of a supported employment approach for adults with ASD on either employment outcomes or aspects of cognitive functioning. The nature of the data provided did not lend itself to a traditional meta-analysis. Since the number of studies was small, and study design and outcomes were diverse, no attempt was made to aggregate results across studies. The following is a descriptive summary of the methodological quality and results of the studies meeting the inclusion criteria.

4.3.1 Methodological Quality Assessment

Methodological quality was assessed by two independent reviewers by evaluating the five elements presented in Table 1. Both of the included studies were quasi-experimental studies for which participant assignment to groups was not random and no assessment of the intervention outcomes was conducted under an examiner or participant blind procedure, and no information was provided regarding the fidelity of the intervention implementation.

TABLE 1: ELEMENTS ASSESSING METHODOLOGICAL QUALITY OF INCLUDED STUDIES

	Design	Unit of Assignment	Unit of Analysis	Attrition	Fidelity of Implementation	Blinding
Garcia-Villamisar, et al. (2000)	QED	Individual	Individual	*	Not Reported	No
Mawhood & Howlin (1999)	QED	Individual	Individual	0%	Not Reported	No

*The data provided were inconsistent and the authors were unable to verify final participant numbers

In addition, an analysis was conducted by two reviewers of the risk of bias using the five sources of bias shown in Table 2. (Higgins & Green, 2011). A value of “high” suggests that there is substantial potential for the introduction of bias for the particular dimension represented. This analysis suggests a judgment of potentially high risk of bias for three of the five sources of risk bias assessed.

TABLE 2: RISK OF BIAS RATING FOR INCLUDED STUDIES

	Selection Bias	Performance Bias	Detection Bias	Attrition Bias	Reporting Bias
Garcia-Villamisar, et al. (2000)	High	High	High	Low	Unclear
Mawhood & Howlin (1999)	High	High	High	Low	Unclear

As reported in the following study results, there were no common outcome measures reported across the two studies and all effect size estimates were based on a single measurement. With these shortcomings in participant selection, performance, detection, attrition, and reporting characteristics the potential risk of bias was judged to be high thus, reducing the potential impact of the findings. It should be noted that even though the exact attrition value associated with the Garcia-Villamisar et al. study could not be determined, the maximum attrition rate possible in the reported data was less than 10% and is consistent with the classification of low risk of bias.

These data taken as a whole suggest that the overall quality of the evidence available for assessing the impact of programs to improve the employment conditions of adults with autism is weak.

4.3.2 Study Results

Two studies, Mawhood and Howlin (1999) and Garcia-Villamisar, Ross and Wehman (2000) were coded as quasi-experimental (QED) studies. See Table 3 below for more information about the two included studies. Mawhood and Howlin described outcomes directly related to employment including employment rate, duration of job retention, and earned wages by comparing an experimental group that consisted of 30 individuals (27 males, 3 females) with a control group consisting of 20 males all seeking employment. The experimental group received guidance from a support worker in the form of job finding, work preparation, and communication with the employers while the control group did not receive any support. Over the two-year period, more participants from the supported group when compared to the control group (a) found paid employment than did participants from the control group ($d = 1.067$, 95% CI = 0.123 to 2.010) (b) did not work significantly greater number of hours per week ($d = 0.328$, 95% CI = -0.628 to 1.284), (c) were employed for a longer period of time ($d = 0.684$, 95% CI = 0.111 to 1.257) and (c) made significantly higher wages ($d = 1.177$, 95% CI = 0.169 to 0.819). In addition to the job related outcomes, Mawhood and Howlin also assessed participant self esteem and found no significant difference between the experimental and control group participants ($d = -0.037$, 95% CI = -0.594 to 0.520).

Garcia-Villamisar, Ross, and Wehman (2000) described effects of a supported employment program on aspects of clinical symptomatology for adults with autism. They examined the differential impact of supported versus sheltered work for adult participants with autism. The supported group had jobs located in the community, worked between 15 and 30 hours, and received job coaches. The sheltered work group did not have jobs in the community and did not receive job coaches.

At the beginning of the study, there were no statistically significant differences between scores on the Childhood Autism Rating Scale (CARS), after three years, the supported group's performance on the CARS was not statistically different from the sheltered group, ($d = -0.229$, 95% CI = -0.764 to 0.306). Garcia-Villamisar et al. (2000) did not report any specific gains or maintenance of employment; however, they argued that individuals with high symptomatology, or challenging characteristics and behaviors, can be unsuitable candidates for competitive employment. Because they found that participation in supported employment compared to sheltered work prevented deterioration in autistic pathology, one can infer that supported employment contributed to greater employment maintenance.

Multiple attempts to correspond with Dr. Domingo Garcia-Villamisar in Spain in an effort to obtain additional information about sample characteristics in both included and excluded studies he authored were unsuccessful. Specifically, Garcia-Villamisar et al. reported inconsistent sample sizes throughout four separate instances for the overall sample and the supported and sheltered employment groups: 1) overall sample: 51 participants, supported employment: 25 participants, sheltered work: 26 participants; 2) overall sample: 55 participants, supported employment: 25 participants, sheltered work: 26 participants; 3) supported employment: 21 participants; 4) Overall sample: 53 participants, sheltered work: 29 participants, supported employment: 24 participants. For analysis purposes, reviewers used the most conservative numerical values in order to produce the most conservative effect size value for this study.

5 Discussion

This systematic review sought to determine the effectiveness of adult employment assistance services for persons with autism spectrum disorders (ASD). The available data for drawing a 'what works' conclusion are minimal. The scientific quality of the evidence is weak, and based on the number of citations identified at the initial stage of the informational retrieval process, there is certainly a need for a more rigorous and controlled study of the effectiveness of employment programs for individuals with ASD. With only two studies available for inclusion and both of them representing a research design that precludes a substantive causal effect interpretation, any conclusions drawn must be viewed with caution.

In terms of the benefits of participation in a program of supported employment, both Mawhood and Howlin (1999) and Garcia-Villamisar et al. (2000) demonstrated an overall advantage of either no intervention or a supported employment advantage over a sheltered workshop condition. However, because none of the outcomes of the two studies were similar, no syntheses of these data were appropriate. No other experimental or quasi-experimental studies were located for this review that would allow for an assessment of the impact of employment training for adults with ASD on the acquisition or maintenance of employment. Given the relatively small number of participants, no judgment can be offered as to the efficacy of employment training for individuals with ASD that would be applicable to a large-scale application.

As questions about employment options for persons with ASD increase, it is significant to note that several authors (Dew & Alan, 2007; Holmes, 2007; Hurlbutt & Chalmers, 2004) have indicated that individuals with ASD are more likely to lose employment due to a difficulty involving social interaction/behavior than they are to lose employment due to an inability to perform their assigned job skills. Holmes (2007), for example, indicated that a major reason for underemployment, unemployment, and job loss of individuals with ASD is the failure to determine and provide the supports needed. The need for more research to definitively identify what works for individuals across the autism spectrum is evident to help support both the design of appropriate and effective support services and their widespread availability at the community level.

It may be that individuals with ASD need extensive training or instruction in order to acclimate to the work environment and to develop the necessary skills needed for the job. Employment training programs that provide individualized job training and support for placement and sustained employment are of interest to the ASD community. Future research is needed to assess the efficacy and effectiveness of such programs, the components of those programs, and the benefits of those programs to individuals with ASD, their family, the employer, and society.

5.1 LIMITATIONS OF STUDIES

The primary limitation of this review is the lack of a sufficient number of appropriately designed studies that would allow for a causal interpretation of measured outcomes based on individuals with ASD participating in employment programs. The small number of studies resulted in a shortage of compatible and relevant data to conduct substantial analyses.

5.2 IMPLICATIONS OF ASSOCIATED QUALITATIVE RESEARCH AND OTHER RELATED STUDIES

This systematic review originated with a question focusing on identifying effective interventions to support persons with ASD in acquiring and sustaining employment. In the course of the review process, a significant body of qualitative literature was identified that augments the findings from the two quantitative studies included in the review. A summary of the implications of these to the findings of this review are described here in terms of their relationship to the employment of people with ASD.

Areas with implications of note include:

- Identification of most appropriate work settings and placements
- Provision of effective supports on the job
- Need for long-term support services for the employer and consumer
- Costs of support
- Effects of employment on persons with ASD

5.2.1 Identification of the Most Appropriate Work Settings and Placements

Appropriate work settings are important to all employed people, including those with ASD. Individuals with ASD choose a wide variety of careers reflecting a diversity of vocational interests. Supported by the qualitative literature, work placements based on an individual's strengths were crucial to sustained competitive employment (Keel, Mesibov, & Woods, 1997; Muller, Schuler, Burton, & Yates, 2003; Smith, Belcher, Jurhs, & Nabors 1994). Although there was a variety of specific jobs where people with ASD work, commonalities emerged across appropriate work settings, including flexible

work schedules, low social interaction, clear expectations of duties, low levels of sensory stimulation, and built-in time to learn new skills (Keel et al., 1997; Muller et al., 2003; Smith et al., 1994; Wehman & Kregel, 1988). Additionally, appropriate work settings for people with ASD ideally included those that ensure employers and colleagues are knowledgeable about the autism spectrum (Keel et al. 1997).

5.2.2 Provision of Effective Supports on the Job

A common theme noted among the qualitative studies reviewed was the importance of job coaching. Specifically, the use of behavioral techniques such as functional behavioral assessment, response cost procedure, positive reinforcement, social skills training, prompt fading, task analyses, and task preference assessments were reported as effective job supports (Burt, Fuller, & Lewis, 1991; Muller et al., 2003; Smith & Coleman, 1986; Wehman & Kregel, 1988). Natural supports, such as the use of co-workers to provide on-site training, social skills training, or transportation, have also been found to be effective in reducing the amount of training provided by the employment specialist (West, Kregel, Hernandez, & Hock, 1997). Furthermore, participants who received simulation training in addition to on-the job training acquired the necessary job skills more quickly, thereby decreasing the amount of training required (Lattimore, Parsons, & Reid, 2006). Equally important, employment supports including job finding and tailored job placement were positively related to successful placement in competitive employment settings of individuals with ASD (Schaller & Yang, 2005).

The qualitative literature suggested that the following vocational supports were most important for success for employees with ASD: appropriate tailored job matching, individualized ASD-specific job supports, social communication supports, autism awareness training, and employer and employee-focused attitudinal supports (Muller et al., 2003).

5.2.3 Need for Long-term Support Services for the Employer and Consumer

The identified qualitative literature also suggested that long-term vocational support services were critical for sustaining employment and should involve both employees and employers (Wehman & Kregel, 1988). Though short-term vocational supports were important in helping individuals with ASD learn how to perform work tasks, long-term supports were needed for people with ASD to sustain employment and adapt to changes in the work environment (Nesbitt, 2000; Schaller & Yang, 2005). An employee's sense of predictability was helpful for daily successful work performance. Furthermore, when changes occurred such as a new staff member, new supervisor, transportation issues, or other life changes occurred, vocational support services facilitated the employee's adaptation to the change (Keel et al., 1997; Schaller & Yang, 2005).

5.2.4 Costs of Support

A common issue reported in the qualitative literature with respect to successful long-term support was the funding of support services. Indeed, the benefits of funding such support services include the increase in employees' income that comes with sustained employment, a decrease in the need for public benefits, and a decrease in the day-to-day living costs shouldered by family members (Howlin, Alcock, & Burkin, 2005). It was noted that many adults with ASD received care at alternative day programs. Community-based competitive employment-oriented vocational support programs, like those we describe in this review, typically cost more than other employment alternatives such as sheltered workshops. However, Howlin et al. (2005) showed that the gap is narrowing between the costs of these support programs. In fact, Cimera and Cowan (2009) show that the state provided vocational rehabilitation services for persons with ASD are expensive but becoming less so in the four year period from 2002 through 2006. In time, costs may reach a "break-even" point eliminating cost differentials between facility-based and community-integrated alternatives. In fact, Cimera (2010) has calculated the benefit cost ratio of persons served by state vocational rehabilitation agencies in the U.S. from the period 2002 to 2007. He found that those placed in supported employment generated an average monthly net benefit of \$475.35 and a benefit cost ratio of 4.20. It seems clear, that significant benefits in terms of social integration, higher wages, and community involvement accrue to persons with ASD in competitive, integrated employment settings.

5.2.5 Effects of Employment on Persons with ASD

Another common theme emerging from the qualitative literature was that employment produced beneficial effects in the behavior and environment of persons with ASD. Employees with ASD and longer lengths of employment tended to be more successfully integrated into the culture of their work place. For example, employees with ASD who had been employed longer tended to have regular contact with co-workers, share work areas, and interact socially with employees without disabilities who had been employed for shorter periods of time. Additionally, after a period of six-months of employment, improvements in areas of independent functioning, expression, domestic and socialization skills were observed (Smith & Belcher, 1994; Wehman & Kregel, 1988).

5.2.6 Additional Detail Across Studies

Table 3: Characteristics of Studies Cited gives additional detail about the included and excluded studies cited in this Discussion section. The table cites the study, project design, participants, duration, program description, and outcome areas for each study and allows for comparison across these studies.

TABLE 3: CHARACTERISTICS OF STUDIES CITED

Study/Journal/ Design	Participants	Duration	Program Description	Outcomes
INCLUDED STUDIES				
Mawhood & Howlin (1999) (journal) <i>Quasi-experimental</i>	Treatment (<i>n</i> = 30) Control (<i>n</i> = 20)	2 years	Support workers provided guidance in: Job searching Work preparation Employer communication	Paid employment Number of hours worked per week Salary Self-esteem
Garcia-Villamisar, Ross & Wehman (2000) (journal) <i>Quasi-experimental</i>	Treatment (supported employment, <i>n</i> = 25) Control (sheltered work, <i>n</i> = 26)	3 years	Supported employment with jobs located in the community and guidance from job coaches	<i>Childhood Autism Rating Scale (CARS)</i>
EXCLUDED STUDIES (Used for Discussion Purposes)				
Burt, Fuller, & Lewis (1991) (journal) <i>Qualitative</i>	<i>n</i> = 4	4 months	Work-training program featuring the following skills: Effective communication, socially acceptable skills, alternative behaviors Decreased dependency on prompts and cues Behavior management	Employment status Employment obstacles Individualized training plan progress
Lattimore, Parsons, & Reid (2006) (journal) <i>Qualitative</i>	<i>n</i> = 4	Not provided	Job task training Job coaching	Job task performance
Muller, Schuler, Burton, & Yates (2003) (journal) <i>Qualitative/Descriptive</i>	<i>n</i> = 18	Not applicable	Recommended vocational supports: Job matching ASD-specific supports Communication supports Attitudinal supports	Employment status*

Study/Journal/ Design	Participants	Duration	Program Description	Outcomes
Smith & Coleman (1986) (journal) <i>Qualitative</i>	$n = 3$	3 - 9 months	Training to ask for assistance Response-cost procedures Behavior monitoring Differential reinforcements of high rates of responding	Reduction of inappropriate behaviors Behavior modification Work Productivity
Wehman & Kregel (1988) (journal) <i>Qualitative</i>	$n = 2$	2.5 - 4 months	Supported employment: Employment training strategies Advocacy strategies	Employment status Number of hours worked per week Salary
Howlin, Alcock, & Burkin (2005) (journal) <i>Single-group</i>	$n = 89$	Not provided	National Autistic Society <i>Prospects</i> Supported Employment: Work preparation Job finding and support in the workplace Job matching	Employment status Job Placement Number of hours worked per week Salary Perceptions of employers, clients, and staff
Keel, Mesibov, & Woods (1997) (journal) <i>Single-group</i>	Treatment (n is over 100)	Not provided	<i>TEACCH-Supported Employment Program:</i> Identifying individual strengths/interests Identifying inappropriate jobs Long-term support services	Job Placement Number of hours worked per week Salary
Smith, Belcher, Juhrs, & Nabors (1994) (journal) <i>Single-group</i>	$n = 70$	1 year	CSAAC: supported employment Job development/matching Job coaching	Employment status Employment placement
Cimera & Cowan (2009) (journal)	<i>Archival data,</i> $n = 11,569$	Not provided	Vocational rehabilitation agencies	Costs associated with services, hours worked, wages

Study/Journal/ Design	Participants	Duration	Program Description	Outcomes
<i>Descriptive</i>				earned, and employment status
Cimera (2010) (journal) <i>Descriptive</i>	Archival data, <i>n</i> = 104,213 (with mental retardation)	Not provided	Vocational rehabilitation agencies	Cost-efficiency of VR agencies Employment status Number of hours worked per week Salary
Nesbitt (2000) (journal) <i>Descriptive</i>	<i>n</i> = 69 organizations	Not provided	National Autistic Society <i>Prospects Supported Employment</i>	Organization's awareness of Asperger syndrome and perceptions of support
West, Kregel, Hernandez, & Hock (1997) (journal) <i>Descriptive</i>	Archival data, <i>n</i> = 385 vocational rehabilitation agencies (random); mean number of consumers per center = 47.6	Not provided	Supported employment with natural supports in job site training, extended services, consumer assessment, or job development activities.	Not provided
Schaller & Yang (2005) (journal) <i>Correlational</i>	Archival data, <i>n</i> = 815	Not provided	Competitive employment Supportive employment	Employment status Number of hours worked per week Salary
Smith & Belcher (1994) (journal) <i>Correlational</i>	<i>n</i> = 59	0.3 - 11.8 years (mean = 6.4, S.D. = 3.4)	Supported employment or community-based educational program featuring: On-the-job training Behavior management Integrated competitive employment with job coach support	Length of employment <i>VII Consumer Scale</i>

*Employment status was not a dependent variable in Muller et al. (2003).

5.3 IMPLICATIONS FOR RESEARCH

This review demonstrates the lack of available research that addresses the efficacy of a variety of employment interventions supporting individuals with ASD. Future research efforts are needed in the development of (1) group randomized controlled trials (RCT) or quasi-randomized designs (QED) that utilized well controlled pre-intervention selection and assignment, and (2) outcome measures for both job specific skills and related skills that have a significant impact on obtaining and sustaining meaningful employment in society at large.

The construction of studies involving individuals with ASD is generally accepted to be difficult at best due to the low incidence and the heterogeneity of the population; thus, we found few individual studies with sufficient statistical power to answer questions of intervention efficacy. The authors of this review would argue that future research needs to focus on the production of studies using small “n” group samples utilizing as rigorous a scientific design as possible. That is, multiple small “n” group studies, over time, could provide a “synthetic n” large enough to conduct a meta-analysis that would yield results useful for wider application across the spectrum of ASD. These studies would focus on the critical elements of employment training for adults with ASD such as:

- Program Characteristics (e.g., employment support models)
- Social Skills Training
- Customization of Employment Placement
- Job-Skill/Interest/Motivation Matching
- Financial Impact of Employment Training
- Employment Sustainability

5.4 PLANS FOR UPDATING THE REVIEW

The authors will examine the review every three years after publication for update as per C2 policy.

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Appendix A: Potential Job Supports and Interventions Glossary

This glossary is provided to assist readers in understanding the differences in terminology related to different types of employment outcomes and job support interventions.

Type	Characteristics
Competitive Employment	occurs in a work setting in which the person with a disability receives wages and benefits that are customary for the position and at a wage level that is at or above the minimum wage
Integrated Employment	a mainstream work setting in which persons with disabilities and persons without disabilities work together and interact socially
Supported Employment	competitive employment in an integrated work setting, or employment in an integrated work setting in which individuals are working toward competitive work consistent with their strengths, resources, priorities, concerns, abilities, capabilities, interests, and informed choice by individuals with significant disabilities who have not traditionally been in competitive employment, have had interrupted or intermittent work due to their significant disability, and who, due to the nature of their disability, need intensive supports for a period followed by extended services to support job maintenance
Sheltered Employment	refers to a wide range of segregated vocational and non-vocational programs for individuals with disabilities such as in sheltered workshops, work activity centers, adult activity centers, day activity centers, and others; the missions, services provided, and funding sources vary widely, however, in most of these settings individuals do not earn minimum wage and work alongside other disabled individuals as co-workers
Non-Integrated Employment	work settings in which persons with disabilities and persons without disabilities do not work together as co-workers and interact socially
Full-time Employment	employers are allowed to determine whether an employee is to be considered full-time, generally refers to employment that involves 36 or more hours per work week

Part-time Employment	generally considered to be less than 35 hours per work week and is determined by the employer
Job Development	services to develop job openings through direct contact with employers for individuals with disabilities seeking employment and who need
Job Tailoring	refers to modification of a job to make it feasible for the particular capabilities/abilities of an individual with a disability and may include a range of options including reduction in work hours, job sharing, flexible work hours, elimination of non-essential work components, modification of the work environment, and the use of technology or other accommodations, among others
Job Coaching	refers to the training of an employee with a disability by an approved specialist, known as a job coach, who uses structured intervention techniques to help the employee learn job tasks to the employer's specifications and to learn the interpersonal skills necessary to be accepted as a worker at the job site; job coaching services can also include job development, advocacy, counseling, travel training, and other services
Vocational Rehabilitation	a dynamic process that enables persons with functional, psychological, developmental, sensory, cognitive and emotional impairments or health conditions to overcome barriers to accessing, maintaining, or returning to employment or another occupation

Appendix B: Documentation of Search Strategies for the Systematic Review

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Academic Search Complete	May 2009	1943 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Psychology and Behavioral Sciences Collection	May 2009	1965 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
CINAHL Plus with Full Text	May 2009	1943 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
ERIC	May 2009	1966 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Professional Development Collection	May 2009	1965 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
PsycINFO	May 2009	1943 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
PsycCRITIQUES	May 2009	1956 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
PsycEXTRA	May 2009	Up to 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
PubMed/MEDLINE	May 2009	1943 - 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
NARIC REHABDATA	May 2009	1956 – 2008	US/ National Rehabilitation Information Center	"(Like "**autis*" Or Like "**childhood with disintegrative disorder*" Or Like "**pervasive developmental disorder*" Or Like "**pervasive developmental disorder not otherwise specified*" Or Like "**spectrum disorder*" Or Like "**Asperger*") And (Like "**treatment*" Or Like "**intervention*" Or Like "**model*" Or Like "**program*" Or Like "**practice*" Or Like "**instruction*" Or Like "**training*" Or Like "**service*" Or Like "**supported employ*" Or Like "**workplace*") And (Like "**adult*" Or Like "**employ*" Or Like "**rehabilitat*" Or Like "**vocational*")" in the title or abstract fields.
CIRRIE	May 2009	1990 - 2008	US/ University at Buffalo	autis AND adult Asperger AND adult autis AND employ autis AND supported autis AND rehabilitat Asperger AND employ Asperger AND supported Asperger AND rehabilitat autis AND intervention asperger AND intervention
ARD	May 2009	1943 -- 2008	UK/ The National Autistic Society	Autism Research Database; (autis* / childhood with disintegrative disorder* / pervasive developmental disorder* / pervasive developmental disorder not otherwise specified / spectrum disorder* / Asperger*) & (treatment* / intervention* / model* / program* / practice* / instruction* / training* / service* / supported employ* / workplace*) & (adult* / employ* / rehabilitat* / vocational*)

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Sage Family Studies Abstracts (Family Studies Abstracts)	May 2009	1958 - 2008	US/ OCLC	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Dissertation Abstracts International	May 2009	1943 - 2008	US/ PROQUEST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Cochrane Central Registry of Controlled Trials	May 2009	2005 - 2008	US/ The Cochrane Collaboration	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
British Education Index	July 2009	1975 - 2008	UK/ PROQUEST	(AUTIS\$ OR CHILDHOOD ADJ DISINTEGRATIVE ADJ DISORDER\$ OR PERVASIVE ADJ DEVELOPMENTAL ADJ DISORDER\$ OR SPECTRUM ADJ DISORDER\$ OR ASPERGER\$) AND (TREATMENT\$ OR INTERVENTION\$ OR MODEL\$ OR PROGRAM\$ OR PRACTICE\$ OR INSTRUCTION\$ OR TRAINING\$ OR SERVICE\$ OR SUPPORTED ADJ EMPLOY\$ OR WORKPLACE\$) AND (EMPLOY\$ OR ADULT\$ OR REHABILITATION\$ OR VOCATIONAL\$)
Canadian Research Index	June 2009	1982 - 2008	CN/ PROQUEST	sub (autis* OR asperger*) OR (childhood w/1 disintegrative w/1 disorder*) OR (pervasive w/1 developmental w/1 disorder*) OR (pervasive w/1 developmental w/1 disorder w/2 otherwise w/1 specified) OR spectrum w/1 disorder* [in Citation and Document Text] AND treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR train* OR service* OR supported employ* [in Citation and Document Text] AND employ* OR adult* OR rehabilitation* OR vocation* OR workplace*

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Australia Education Index	July 2009	1979 - 2008	AU/ PROQUEST	David Pickup (AUTIS\$ OR CHILDHOOD ADJ DISINTEGRATIVE ADJ DISORDER\$ OR PERVASIVE ADJ DEVELOPMENTAL ADJ DISORDER\$ OR SPECTRUM ADJ DISORDER\$ OR ASPERGER\$) AND (TREATMENT\$ OR INTERVENTION\$ OR MODEL\$ OR PROGRAM\$ OR PRACTICES\$ OR INSTRUCTION\$ OR TRAINING\$ OR SERVICE\$ OR SUPPORTED ADJ EMPLOY\$ OR WORKPLACE\$) AND (EMPLOY\$ OR ADULT\$ OR REHABILITATION\$ OR VOCATIONAL\$)
CBCA Education	June 2009	1982 - 2008	CN/ PROQUEST	sub (autis* OR asperger*) OR (childhood w/1 disintegrative w/1 disorder*) OR (pervasive w/1 developmental w/1 disorder*) OR (pervasive w/1 developmental w/1 disorder w/2 otherwise w/1 specified) OR (spectrum w/1 disorder*) [in Citation and Document Text] AND treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR train* OR service* OR supported employ* [in Citation and Document Text] AND employ* OR adult* OR rehabilitation* OR vocation* OR workplace*
ABI Inform Global	May 2009	1943 - 2008	US/ PROQUEST	SU(autis* OR asperger*) OR (childhood w/1 disintegrative w/1 disorder*) OR (pervasive w/1 developmental w/1 disorder*) OR (pervasive w/1 developmental w/1 disorder w/2 otherwise w/1 specified) OR (spectrum w/1 disorder*) [in citation and full text] AND SU(employ* or train*) OR program* OR practice* OR instruction* OR service* OR supported employ* [in citation and full text] AND adult* OR rehabilitation* OR vocational* OR workplace*

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Sociological Abstracts	May 2009	1952 - 2008	US/CSA	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Web of Science	May 2009	1943 - 2008	US/ Thomason Reuters	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Academic One File	May 2009	1980 – 2008	US/ GALE	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
WorldCat [for monographs]	May 2009	1943 – 2008	US/ OCLC	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Science and Technology Collection	May 2009	1943 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
PsycArticles	May 2009	1943 – 2008	US/ EBSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
Business Source Complete	May 2009	1943 – 2008	US/ BSCOHOST	(autis* OR childhood with disintegrative disorder* OR pervasive developmental disorder* OR pervasive developmental disorder not otherwise specified OR spectrum disorder* OR Asperger*) AND (treatment* OR intervention* OR model* OR program* OR practice* OR instruction* OR training* OR service* OR supported employ* OR workplace*) AND (adult* OR employ* OR rehabilitat* OR vocational*)
FRANCIS	July 2009	1984 – 2008	FR/CSA	autis* OR asperger* OR pervasive develop* OR pervasive child* OR childhood disruptive* OR childhood desintegrative disorder OR childhood disintegrative disorder OR childhood developmental disorders AND treatment* OR interv* OR model* OR program* OR practice* OR instruc* OR training* OR service* OR supported employ* AND employ* OR adult* OR rehabilita* OR vocation* OR workplace*
CBCA Business	Dec 2009	1970 - 2008	CN/ PROQUEST	autis* OR asperger* OR pervasive develop* OR pervasive child* OR childhood disruptive* OR childhood desintegrative disorder OR childhood disintegrative disorder OR childhood developmental disorders AND employ* OR vocation* OR workplace* OR supported employ* Restricted to <i>Scholarly journals, including peer-reviewed</i> SU (Autism OR Asperger's syndrome) Citation and indexing (Autism OR Asperger's syndrome)

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
ProQuest European Business	Dec 2009	1971 - 2008	EU/ PROQUEST	SU (Autism) OR Citation and abstract (asperger* OR "spectrum disorder*")

Appendix C: Coding Form: Employment for Individuals with Autism Studies

Full Citation (APA style):

Is this an Intervention Study?

- Yes
- Unclear
- No, then STOP!

Were the Participants at least 18 Years Old?

- Yes
- Unclear
- No, then STOP!

Were the Participants out of secondary school or not in a school-to-work transition program?

- Yes
- Unclear
- No, then STOP!

I. Publication Source:

- | | |
|---|--|
| <input type="checkbox"/> Journal Article | <input type="checkbox"/> Organizational Report |
| <input type="checkbox"/> Conference paper | <input type="checkbox"/> Book or Book Chapter |
| <input type="checkbox"/> Master/Doctoral Thesis | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Technical Report | |

II. Subject Characteristics (pg.)

Groups	Pretest (n)	Posttest (n)	Attrition (n)	1 st Followup (n)	F Attrition (n)	Age (yr; mos)	% Male
T:							
T:							
CP:							
CP:							
CO:							
RG:							
RG:							
III.							

Note: For groups, T=treatment, CP=comparison, CO=control and RG=Reference Group. “Attrition” is the difference between the pretest and posttest “n” and “F_Attrition” is the difference between the posttest and 1st followup “n.”

Comments:

III. Sample Source (pg.)

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> Public Agency | <input type="checkbox"/> Not Reported |
| <input type="checkbox"/> Private Agency | <input type="checkbox"/> Other |

Comments:

IV. SES (pg.)

- | | | |
|-------------------------------------|--|--|
| <input type="checkbox"/> Low | <input type="checkbox"/> Middle-Upper | <input type="checkbox"/> Unlabeled Mixed |
| <input type="checkbox"/> Low-Middle | <input type="checkbox"/> Upper | <input type="checkbox"/> Unclear |
| <input type="checkbox"/> Middle | <input type="checkbox"/> Labeled Mixed | <input type="checkbox"/> Not Reported |

Comments:

V. Education (pg.)

- | | |
|---|--|
| <input type="checkbox"/> Some High School | <input type="checkbox"/> Some College |
| <input type="checkbox"/> High School Graduate | <input type="checkbox"/> College Diploma |
| <input type="checkbox"/> Other: | |

Comments:

VI. Study Community Setting (pg.)

- | | | | |
|--------------------------------|-----------------------------------|--------------------------------|-----------------------------|
| <input type="checkbox"/> Urban | <input type="checkbox"/> Suburban | <input type="checkbox"/> Rural | <input type="checkbox"/> NR |
|--------------------------------|-----------------------------------|--------------------------------|-----------------------------|

Comments:

Geographic Setting:

VII. Employment Setting (pg.)

- Integrated/Competitive (work is performed alongside non-disabled co-workers)
- Non-integrated (work is performed entirely alongside disabled co-workers)
- Supported Employment
- Not Reported

Comments:

VIII. Participant Classification (pg.)

- ASD
 - Autism
 - Asperger
 - PDD-NOS
 - Rhett Syndrome
 - Childhood Disintegrative Disorder
- Comments:

IX. Classification Severity Level (pg.)

- Mild
- Moderate-Severe
- Mild-Moderate
- Severe
- Moderate
- Mixed
- Not Reported

Comments:

X. Race/Ethnicity (pg.)

	Group 1	Group 2
<input type="checkbox"/> African-American	%	%
<input type="checkbox"/> American-Indian	%	%
<input type="checkbox"/> Asian	%	%
<input type="checkbox"/> Hispanic/Latino	%	%
<input type="checkbox"/> White/Caucasian	%	%
<input type="checkbox"/> Mixed	%	%
<input type="checkbox"/> Other:	%	%
<input type="checkbox"/> Not Reported		

Comments:

Intervention Characteristics (pg. _____)

XI. Describe Intervention Characteristics (pg. _____)

Details of Intervention intended for treatment/comparison groups including how and when administered.

Average Length of Intervention Program (pg. _____):

Length of time of participation activity (pg. _____): _____ per

Number of Sessions (pg. _____):

Primary Type of Employment:

Wholesale Trade

- Retail Trade
- Transportation & Warehousing
- Information
- Finance
- Professional
- Education & health
- Leisure & Hospitality
- Other Service:

Goods-processing Industries

- Construction Other Service:
- Manufacturing

Public Administration

- Local government Federal government
- State government Other Service:

Comments:

XII. Outcome Measure(s):

1. Length of Time to Place in Employment:
2. Length of Time Employed:
3. Re-employments Included: Yes No Not Reported
4. Employment Status: Full Time Part Time
5. Hours worked per week:
6. Post-placement Hourly Wages:
7. Dropped Out Before Placement Occurred:
8. Employer Evaluation:
9. Co-Worker Evaluation:
10. Participant Evaluation:

Comments:

Design Characteristics (pg _____)

XIII. Research Design Characteristics:

Which of the following research design types were used to examine the impact of program effects for employment placement?

- RCT Individual Randomized Design
- RCT Group Randomized Design
- Quasi-Experiment: Equivalent Comparison Design (individuals)
- Quasi-Experiment: Equivalent Comparison Design (groups)
- Quasi-Experiment: Nonequivalent Comparison Design (individuals)
- Quasi-Experiment: Nonequivalent Comparison Design (groups)
- Quasi-Experiment: Regression Discontinuity
- Single Group Quasi-Experiment: Interrupted Time Series Design
- Single Group Pretest/Posttest design
- ABA Single Subject Design
- MBL Single Subject Design
- Survey: Cross Sectional
- Survey: Longitudinal

- Other Design:
- If none of the above then **STOP!**

Comments:

XIV. Method of Random Assignment (pg)

- Random Number Generation
- Coin Flip
- Envelope
- Other
- NR

Comments:

XV. Recruitment Pool (pg)

- Referral Criterion Pre-placement Test Score
- Existing Group Volunteer Waiting List
- Other NR

Comments:

XVI. Blinding

- Researcher (pg) Assessor (pg)
- Participant (pg) Employer (pg)
- Intervener (pg) Other (pg)

Comments:

XVII. Fidelity of Implementation

Intervention implemented as described (pg)

- No Yes NR

Comments:

XVIII Effect Size Characteristics (Use d-Index Value if Provided)

Groups Compared: **Group 1:** **Group 2:**

Outcomes

Groups	1	2	1	2	1	2	1	2
Mean	_____	_____	_____	_____	_____	_____	_____	_____
SD	_____	_____	_____	_____	_____	_____	_____	_____
N-Post	_____	_____	_____	_____	_____	_____	_____	_____
N-FollowUp 1	_____	_____	_____	_____	_____	_____	_____	_____
N-FollowUp 2	_____	_____	_____	_____	_____	_____	_____	_____
N-FollowUp 3	_____	_____	_____	_____	_____	_____	_____	_____
N-FollowUp 4	_____	_____	_____	_____	_____	_____	_____	_____
d-index	_____	_____	_____	_____	_____	_____	_____	_____
F value	_____	_____	_____	_____	_____	_____	_____	_____
Chi-square	_____	_____	_____	_____	_____	_____	_____	_____
p value	_____	_____	_____	_____	_____	_____	_____	_____
t value	_____	_____	_____	_____	_____	_____	_____	_____
U value	_____	_____	_____	_____	_____	_____	_____	_____

Method of Analysis (pg)

Intention to Treat: 0=no 1=yes

Treated Participants Only 0=no 1=yes

Comments:

Appendix D: Reasons Stage 2 Studies were Excluded from the Systematic Review

Reason for Exclusion: <i>Not an intervention study (n = 49)</i>	
Author/Journal	Title
Arvanitis, H. (2008) (journal)	Adults on the autism spectrum can benefit the work force: How one New Jersey advocacy agency is paving the path to employment
Berkell, D. E. (1985) (journal)	Preparing autistic students for competitive employment: A model program
Berkell, D. E. (1985) (journal)	Career development for youth with autism
Blake, A. (1990) (journal)	Job market opens up to worker with autism
Burkin, C. (1998) (journal)	Prospecting for work
Capo, L. C. (2001) (journal)	Autism, employment, and the role of occupational therapy
Cuffel, B. J. (1989) (dissertation)	A methodology for meta-analysis of single case designs and its demonstration in the treatment of autism literature
Dalferth, M. (1993) (journal)	Adolescents with autism syndrome and autistic manifestations in vocational education centers.
Donovan, S. (2008) (journal)	Conversation: entrepreneur Thorkil Sonne on what you can learn from employees with autism
Foley, S. M., Butterworth, J., & Heller, A. (2000). (journal)	Vocational rehabilitation interagency activity improving supported employment for people with severe disabilities
Grasso, E., Jitendra, A. K., Browder, D. M., & Harp, T. (2004) (journal)	Effects of ecological and standardized vocational assessments on office of vocational rehabilitation counselors' perceptions regarding individuals with developmental disabilities
Greene, S. B. (2006) (dissertation)	An investigation of relationships between customer demographics, case service variables, and successful vocational rehabilitation outcomes for transition-age adults with autism
Hagner, D., & Cooney, B. F. (2005) (journal)	"I do that for everybody": Supervising employees with autism
Halle, J. W., Schloss, P. J., &	Using changing-criterion methodology to enhance the vocational

Schloss, C. N. (1989) (journal)	performance of a developmentally disabled adult: A home-based demonstration
Hillier, A., Campbell, H., Mastriani, K., Izzo, M. V., Kool-Tucker, A. K., Cherry, L., & Beversdorf, D. Q. (2007) (journal)	Two-year evaluation of a vocational support program for adults on the autism spectrum
Hillier, A., Fish, T., Cloppert, P., & Beversdorf, D. Q. (2007) (journal)	Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum
Howlin, P. (2003) (book chapter)	Interventions for individuals with Asperger's syndrome
Howlin, P., Alcock, J., & Burkin, C. (2005) (journal)	An 8-year follow-up of a specialist supported employment service for high-ability adults with autism or Asperger syndrome
Kamioka, K. (1997) (journal)	Research on the job search of autistic high school graduates
Keel, J. H., & Mesibov, G. B., & Woods, A. V. (1997) (journal)	TEACCH-supported employment program
Kemp, D. C., & Carr, E. G. (1995) (journal)	Reduction of severe problem behavior in community employment using an hypothesis-driven multicomponent intervention approach
Kiernan, W., McGaughey, M., Lynch, S., Schalock, R., & McNally, L. (1991) (report)	National survey of day and employment programs: Results from State VR agencies
Lipski, A. (2003, Spring) (journal)	Success story in job search
Makarchuk, S. R. (1996) (thesis)	Vocational placement issues for adults with autism in Saskatchewan
Matthews, A. (1996) (journal)	Employment training and the development of a support model within employment for adults who experience Asperger syndrome and autism: The Gloucestershire Group Homes model
Mawhood, L., & Howlin, P. (1997) (brochure)	A supported employment scheme for able adults with autism or Asperger syndrome
Mossman-Glazer, E. (2007, January-February) (periodical)	Helping your employee with Asperger syndrome understand workplace social skills
Muller, E., Schuler, A., Burton, B. A., & Yates, G. B. (2003) (journal)	Meeting the vocational support needs of individuals with Asperger syndrome and other autism spectrum disabilities
Nesbitt, S. (2000) (journal)	Why and why not? Factors influencing employment for individuals with Asperger syndrome
Nuehring, M. L., & Sitlington, P. L. (2003) (journal)	Transition as a vehicle
Oba, M. (1999). (journal)	The supported employment of Hoshi-ga-oka dormitory
Parker, C., Jones, M., & Wheatcroft, D. (2008) (journal)	Supporting and caring for adults with ASD: developing job-specific training
Petty, D. M., & Fussell, E. M. (1997) (journal)	Employer attitudes and satisfaction with supported employment

Ridley, J., & Hunter, S. (2006) (journal)	The development of supported employment in Scotland
Robertson, J., & Emerson, E. (2006) (report)	A systematic review of comparative benefits and costs of models of providing residential and vocational supports to adults with autistic spectrum disorder
Rogan, P., Banks, B., & Howard, M. (2000) (journal)	Workplace supports in practice: As little as possible, as much as necessary
Roocke, T., & Smith, E. (2005) (report)	Work that works: A resource for supporting individuals with an autism spectrum disorder in the workplace
Rutter, M. (1970) (journal)	Autistic children: infancy to adulthood
Schaller, J., & Yang, N. K. (2005) (journal)	Competitive employment for people with autism: Correlates of successful closure in competitive and supported employment
Sellers, J. (2007) (dissertation)	The employment of individuals with autism spectrum disorders in the state of Alabama
Seltzer, M. M., & Krauss, M. W. (2002) (report)	Adolescents and adults with autism: A profile of adolescents and adults with autism spectrum disorders
Senior, R. (1996, Spring) (journal)	Supported employment
Smith, M. D., & Belcher, R. G. (1994) (journal)	Factors influencing integration of employees with autism
Smith, M. D., Belcher, R. G., Juhrs, P. D., & Nabors, K. (1994) (journal)	Where people with autism work
Sugiyama, T., & Takahasi, O. (1996) (journal)	Jiheishou to shurou
Van Bourgondien, M. E., & Woods, A. V. (1992) (book chapter)	Vocational possibilities for high-functioning adults with autism
Wehman, P. (2006) (book)	Life beyond the classroom: Transition strategies for young people with disabilities
Wehman, P., & Revell, W. G. (1996) (journal)	Supported employment from 1986 to 1993: A national program that works
West, M. D., Kregel, J., Hernandez, A., & Hock, T. (1997) (journal)	Everybody's doing it: A national study of the use of natural supports in supported employment
Reason for Exclusion: <i>Outcomes unrelated to employment (n = 9)</i>	
Garcia-Villamizar, D., Wehman, P., & Navarro, M. D. (2002) (journal)	Changes in the quality of autistic people's life that work in supported and sheltered employment: A 5-year follow-up study
Halle, J. W., Schloss, P. J., & Schloss, C. N. (1989) (journal)	Using changing-criterion methodology to enhance the vocational performance of a developmentally disabled adult: A home-based demonstration

Hillier, A., Fish, T., Cloppert, P., & Beversdorf, D. Q. (2007) (journal)	Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum
Inge, K. J., & Dymond, S. (1994) (journal)	Challenging behaviors in the workplace: Increasing a student's access to community-based vocational instruction
Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2002) (journal)	A prework assessment of task preferences among adults with autism beginning a supported job
Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2003) (journal)	Assessing preferred work among adults with autism beginning supported jobs: Identification of constant and alternating task preferences
Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2006) (journal)	Enhancing job-site training of supported workers with autism: A reemphasis on simulation
Smith, M. D. (1988) (book)	Working with autism: Strategies for achieving behavioral adjustment at work
Smith, M. D., & Coleman, D. (1986) (journal)	Managing the behavior of adults with autism in the job setting
Reason for Exclusion: <i>Participants did not have ASD (n = 5)</i>	
Chadsey, J. G., Linneman, D., Rusch, F. R., & Cimeria, R. E. (1997) (journal)	The impact of social integration interventions and job coaches in work settings
Sowers, J. A., Milliken, K., Cotton, P., Sousa, S., Dwyer, L., & Kouwenhoven, K. (2000) (book chapter)	A multielement approach to creating change in a state employment system
Stephens, D. L., Collins, M. D., & Dodder, R. A. (2005) (journal)	A longitudinal study of employment and skill acquisition among individuals with developmental disabilities
West, M., Revell, W. G., & Wehman, P. (1992) (journal)	Everybody's doing it: A national study of the use of natural supports in supported employment
Yeldell, C. F. (1990) (thesis)	Factors of success for developmentally disabled persons participating in individual supported employment
Reason for Exclusion: <i>Participants did not have ASD (n = 5)</i>	
Hume, K., & Odom, S. (2007) (journal)	Effects of an individual work system on the independent functioning of students with autism
Kobayashi, R., Murata, T., & Yoshinaga, K. (1992) (journal)	A follow-up study of 201 children with autism in Kyushu and Yamaguchi areas, Japan
Polignano, M. L. (1999) (dissertation)	A study of employers' perceptions of the most essential social and behavior skills necessary for individuals with autism to maintain employment
Whorton, D. M. (1983) (thesis)	The effects of vocational training on work production rates, attention to task, worker rating evaluations, and enthusiasm scale scores for autistic and autistic-like adolescents
Reason for Exclusion: <i>Case-study only (n = 4)</i>	

Burt, D. B., Fuller, S. P., & Lewis, K. R. (1991) (journal)	Competitive employment of adults with autism
Herrera, G., & Labajo, G. (2004) (journal)	Assessing BABar device as a tool for supporting labour integration of a severely affected person with autism who carries out classifying tasks
Mossman-Glazer, E. (2007, January-February) (journal)	Helping your employee with Asperger syndrome understand workplace social skills
Wehman, P., & Revell, W. G. (1996) (journal)	Supported employment from 1986 to 1993: A national program that works
Reason for Exclusion: <i>No comparison group (n = 1)</i>	
Garcia-Villamizar, D., & Hughes, C. (2007) (journal)	Supported employment improves cognitive performance in adults with autism
Reason for Exclusion: <i>Unable to retrieve (n = 1)</i>	
Smith, M. D. (1986) (report)	Achieving non-sheltered employment for the severely handicapped: Annual progress report.

Appendix E: References to Studies Included and Excluded from the Systematic Review

INCLUDED STUDIES

- Garcia-Villamizar, D., Ross, D., & Wehman, P. (2000). Clinical differential analysis of persons with autism in a work setting: A follow-up study. *Journal of Vocational Rehabilitation, 14*(3), 183-185.
- Mawhood, L., & Howlin, P. (1999). The outcome of a supported employment scheme for high-functioning adults with autism or Asperger syndrome. *Autism, 3*(3), 229-254.

EXCLUDED STUDIES

- Arvanitis, H. (2008). Adults on the autism spectrum can benefit the work force: How one New Jersey advocacy agency is paving the path to employment. *Exceptional Parent, 38*(10), 22-23.
- Berkell, D. E. (1985). Career development for youth with autism. *Journal of Career Development, 13*(4), 14-20.
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