

Employment Outcomes for People With Autism Spectrum Disorder: A Theory Mapping of the Evidence

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Background: People with autism spectrum disorder (ASD) are three to four times less likely to be with employment compared to neurotypical others. Theory based studies may provide helpful indicators for the design and implementation of employment supports for people with ASD.

Objective: This critical review examined the extent of the evidence for theory in studies on employment outcomes for people with ASD and taking into account social inequality. For the evidence, 35 studies were selected for review if they were published in the period 2000–2016 and assessed for the association between work participation with ASD applying descriptive survey or quasi-experimental design.

Methods: Studies were examined for use of any theory, including four predetermined theory types: social liminality, psychosocial, behavioral, and structural-infrastructure. They were also content-analyzed to determine if they cited any evidence of social inequality influences on employment outcomes with ASD.

Findings: Results indicated that none of the studies explicitly applied and tested a theory on work participation with ASD. Rather, the majority of the studies were implicitly framed on predominantly behavioral type theory with minor elements of workplace psychosocial support theory-oriented interventions. Regard of structural-infrastructure type theory addressing social inequality is incidentally addressed by a few of the studies ($n = 3$) that examined family income status influences.

Conclusion: In conclusion, extant studies on the association between employment outcomes and ASD are seriously limited in their explanatory value by a lack of theoretical grounding. They also neglect influences of antecedent social inequality in employment outcomes with ASD. Future studies should apply specific theory to questions on employment outcomes with ASD to provide usable evidence to inform employment support policy instruments and interventions for people with ASD.

Keywords: work participation; autism; theory; practices; policies

Autism spectrum disorder (ASD) is a high-incidence condition affecting approximately 1 out of 68 children (Centers for Disease Control and Prevention, 2014). ASDs are a set of neurologically based developmental disorders characterized by difficulties with planning and sequencing tasks, social communication, and presence of perseverative or repetitive behaviors *Diagnostic and*

Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013). Furthermore, individuals with ASDs have social

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skill deficits, a tendency to fixate on certain tasks or topics, difficulty adhering to routines, and the ability to process visual information more efficiently than verbal information (Standifer, 2009).

Only 6% to 25% of persons with ASD are employed (Newman et al., 2011; Nicholas et al., 2015; Roux et al., 2012). Adults with ASD are three to four times less likely to be employed than working-age adults who do not have a disability (Deloitte Access Economics, 2011; Hedley et al., 2016; Taylor & Seltzer, 2012). The high rate of unemployment of adults with disabilities persists despite an increase in their number seeking vocational rehabilitation services (Burgess & Cimera, 2014). About 56% to 76% of adults with ASD with employment are with facility-based work setting rather than competitive employment on the open labor market (Migliore et al., 2010; Taylor & Seltzer, 2011). Findings of studies based on the National Longitudinal Transition Study-2 (NLTS2) dataset (e.g., Roux et al., 2012) and the Rehabilitation Service Administration (RSA-911) dataset (e.g., Burgess & Cimera, 2014) are consistent with the statistics to indicate marginal to poor employment rate with ASD. The NLTS2 data are from a 10-year study (2000–2009) of youth who received special education services during the period, while the RSA-911 data are from annual documentation of use of public vocational rehabilitation services.

Despite these well-disseminated findings, there is disappointingly little evidence on what can be done to help adults with ASD to gain and retain employment (Howlin & Moss, 2012), and the research base on work participation with ASD is very thin and comprising a few controlled studies or that utilized experimental design ($n \leq 12$), some descriptive surveys, and case studies (Hedley et al., 2016; Wehman et al., 2014). Related studies are characterized by poor research design conceptualization and outcomes measurement, compromising their explanatory value (Hedley et al., 2016; Holwerda et al., 2012; Nicholas, 2015; Taylor & Seltzer, 2012). Even more disconcerting is the fact that it is unclear as to the types of theories behind the studies on employment participation of people with ASD. For instance, a search of the following databases for related studies published since year 2000 yielded a null result: Google Scholar, PubMed, MEDLINE (Ovid), EMBASE, Web of Science, ERIC (Education Resources Information Center),

Sociological Abstracts, Social Services, using the index terms and phrases “ASD,” “and “employment, work, vocational rehabilitation” (and synonyms) and “social inequality,” “disadvantaged,” “rural, low socio-economic status” (and synonyms) and “theory” and “conceptual model” (and synonyms). Theory is essential to explain the associational relationships among social outcomes for populations or segments (Krieger, 2014). On the basis of well-supported theory or one with a strong explanatory power, it is possible to understand the causal processes behind observations or intervene with policy instruments in order to effect change (Stoker & Evans, 2016).

The extent of theory-informed evidence in explaining employment outcomes for people with ASD in the context of rural or low-resource neighborhood has not been reviewed. To address this significant gap regarding the use of theory in studies on the employment participation with ASD, this scoping review sought to address four objectives: (a) assess the availability of evidence on the association employment outcomes and ASD according to type of theories, (b) identify the extent to which the evidence considers social inequalities as context for the relationship between employment outcomes and ASD, and (c) identify and highlight any gaps in the literature to inform subsequent study.

This review was guided by the following questions: (a) How are studies on employment outcomes with ASD framed on theory types important for policy and intervention? (b) To what extent are social inequalities addressed by the extant evidence of employment outcomes with ASD? (c) How may the gaps in theory-led evidence be addressed by future research aimed to address policy and practice on employment participation by people with ASD? The approach to examining the evidence for theory utilized in this study is derived from similar scoping reviews in different disciplines (i.e., Davies et al., 2010; Singh et al., 2016).

A critical review is relevant for mapping the emerging evidence on any research activity with regard to the nature and extent of such evidence (Arksey & O'Malley, 2005; Campbell et al., 2014; Levac et al., 2010). Therefore, it is a more suitable approach for this goal of the study, which is to determine the theory orientation of the research on employment outcomes and ASD.

SOCIAL INEQUALITY, DISABILITY, AND EMPLOYMENT OUTCOMES

Social inequalities refer to the disparities in affordances by populations or subpopulations compared to typical others in accessing basic life affordances like employment, healthcare, neighborhood safety, and a satisfying quality of life. As Shattuck and Roux (2015) aptly observe, “unemployment is not just an individual predicament”; it is a social problem and for solutions research must address “the social environment and the impact of interventions targeting a community or policy level” rather than being overly “modifying individual behaviors and abilities” even though also “an important pursuit” (p. 246). For instance, young adults with ASD from low Socio-economic status (SES) families were more likely to be unemployed on transitioning from the school system to community (Shattuck et al., 2012; Taylor & Mailick, 2013; Taylor & Seltzer, 2010). This can be likely explained by the lack of employment-related social networks and lower access to disability support services for low SES families (Shattuck et al., 2012; Taylor & Seltzer, 2010).

Labor market dynamics such as the availability of work positions in communities and neighborhoods both sustain and drive social inequalities (Coburn, 2000; Muntaner et al., 1999; Navarro, 2002). In the US context, social inequalities are well documented by habit so that those living in rural areas have fewer affordances or access to basic amenities compared to those in urban areas, and by neighborhood characteristics so that those in low SES neighborhoods are comparatively more deprived (Subramanian & Kawachi, 2004; Shattuck et al., 2013). In this regard, young adults with ASD from high-income families had superior work participation compared to those from low SES backgrounds, suggesting the importance of social equity context in addressing employment with ASD (Chiang et al., 2013; Hillier & Galizzi, 2014; Holwerda et al., 2012; Murayama et al., 2012).

Young adults with ASD from lower-income families showed a higher level of maladaptive behavior after high school exit (Taylor & Seltzer, 2011), suggesting coping resource strains to family and themselves post-high school. More than 75% of young adults with ASD lived with their families (Taylor & Seltzer, 2011). The material, emotional, and time investment costs to families to support an adult member with ASD to access and retain

employment are steep (Hillier & Galizzi, 2014) and could be overwhelming in settings with high-level social inequality such as rural areas and low SES neighborhoods. Yet, the bulk of the research on employment outcomes of individuals with ASD has focused on identifying their working status, types of employment, average earnings, working hours, and job retention (Chen et al., 2015), and at the neglect of the area-level social equity or inequality context in which employment is sought or achieved.

These social inequality effects arise from structural “social ecologies” in which income inequality is a “social pollutant” harming the community participation of members, including their health outcomes (Baldwin et al., 2014; Kondo et al., 2009; Pickett & Wilkinson, 2015; Subramanian & Kawachi, 2006; Wilkinson & Pickett, 2006) and employment participation (Howlin, 2000; Howlin & Moss, 2012)—at least below a certain threshold level of income (Wagstaff & Doorslaer, 2000). At an ecological level, low-resource settings have more people exposed to risks of social exclusion and marginalization compared to social inequalities in high-resource settings (Macintyre, 1997; Marmot & Wilkinson, 2000; Townsend et al., 1982; Wagstaff & Doorslaer, 2000). In this regard, theory-informed policy interventions aim to reduce social inequality and add more social life to community members, not just to their life as community members.

With disability, the effects of social inequalities on social outcomes, including employment participation, are immeasurably multiplied from the fact that having a disability is associated with a higher risk of social exclusion or marginalization (Willet & Deegan, 2001). Several theories and conceptual models have been proposed to explain the risk to adverse social outcomes from having a disability: social liminality, behavioral gradient predisposition and psychosocial adaptation, and coping and structural-infrastructure. The extent to which studies on employment and ASD have been framed applying these theory types has not been addressed in the literature and in the context of area-level social inequality.

Social Liminality Theory

Social liminality models (Willet & Deegan, 2001) emphasize the role of external social-attitudi-

nal influences of social outcomes on disability. For instance, with ASD, the risks of exclusion from employment by implicit discrimination by employers, work colleagues, and/or employment networks are high (Gewurtz et al., 2016; Meyer, 2016). Individuals with ASD contend with high rates of exclusion in the hiring process (Baldwin et al., 2014; Richards, 2012). For instance, individuals with ASD are likely to be underemployed with unfulfilling repetitive or routinized work tasks, socially isolated by work peers, and unfairly dismissed from employment (Baldwin et al., 2014). They also are at an elevated risk of being excluded from vocational rehabilitation services due to being perceived as ineligible on account of their intellectual disability (Taylor & Seltzer, 2011), and if hired, they may be skipped from job training opportunities (Baldwin et al., 2014). Similarly, the chances of competitive employment in community settings with ASD are poor (Migliore et al., 2012; Roux et al., 2013) even for the small proportion (<15%) with post-secondary qualifications (Taylor & Seltzer, 2011), further underscoring social liminality effects of employment participation with ASD.

Social liminality effects would be especially elevated with systemic social inequalities associated with rural or poor neighborhood habitats. This confluence of disadvantage is explained by the fact that high social inequality typically generates heightened prejudice and discrimination against different and historically disadvantaged others (e.g., by disability, social class, ethnicity, gender) (Rumrill et al. 2016; Schaller & Yang, 2005). For example, being Black/African American was negatively related to a successful case closure for individuals seeking supported employment services (Schaller & Yang, 2005), whereas being a White male of older age was positively related to job placement success and with supports (Lawer et al., 2009). The fact that the increasing enrolment of adults with ASD for employment services will include a higher proportion of persons from historically disadvantaged minority populations is not addressed in current autism research (Shattuck & Roux, 2015). High social inequality undermines trust and damages social relationships necessary for individual and community partnerships for employment participation.

Psychosocial Theory

Psychosocial adaptation and coping-oriented theories explain employment participation with disability in terms of personal and social support resources in one's environment (Bishop et al., 2007; Holwerda et al., 2013). In their diversity, psychosocial adaptation and coping theories propose personal perceptions with disability-related restrictions, and options to circumvent those limitations (say with accommodations) add a level of control over their social outcomes, including employment participation. For instance, individuals with ASD having difficulties in managing time and transitioning between tasks may overcome such limitations with the use of digital assistive devices such as computer tablets, personal digital assistants (PDAs), and smartphones, which might also help improve the job performance of individuals with ASDs (Baxter et al., 2013; Burke et al., 2013; Gentry et al., 2015; Gentry et al., 2012; Hill et al. 2013). Assistive devices may also be utilized to promote independence among workers with ASDs by prompting transitions between tasks, supporting on-task behavior, and assisting with time management (Gentry et al., 2012; Hill et al., 2013; Holwerda et al., 2013). Social support by family and peers may also help people with ASD to achieve a range of job-related functions, such as attaining and retaining employment and navigating workplace assignments requiring collaboration (Cimera, 2010; Gentry et al., 2015; Hill et al., 2013). For instance, community-based employment support programs with in-school transition preparation enhanced work entry and retention (Cimera, 2010). However, in communities with high levels of social inequality, perceived or actual constant social evaluative threats by non-disabled others likely led to lower adaptation and coping or a sense of lack of control. Sense of loss of control is associated with disvaluing one's psychosocial assets for work participation, exacerbating social inequity effects of employment opportunity marginalization.

Behavioral Theory

Behavioral predisposition theories would explain differences in social outcomes with disability in terms of a social-behavioral gradient or continuum

in which higher functioning with disability would portend lower supports to attain the same social outcomes as typical others (Holwerda et al. 2013; Mpofu & Mpofu, in press). For instance, ASD is on a continuum with those with low functioning presenting with more severe communication difficulties and secondary disability and for which they would require accommodations in more life domains than their high-functioning peers (Holwerda et al., 2013; Lawton, 2007). By contrast, high-functioning ASD people increased intellectual ability, greater social and adaptive skills, and absence of secondary disability (Attwood, 2006; Farley et al., 2009) and would require accommodations in fewer life domains than their low-functioning peers (Attwood, 2006). High cognitive functioning predicted employment success with ASD than any other personal attribute (Baldwin et al., 2014; Holwerda et al., 2012). Even within a level of ASD functioning, permutations on communication and other behavioral skills will vary significantly among individuals (Hendricks, 2010). Behavioral theory-oriented studies have considered the role of training high-functioning ASD in social and vocational skills (Palmen et al., 2012; Hiller et al. 2011) as well as employment preferences of people with ASD (Migliore et al. 2007; Taylor et al. 2012).

As with typical or ordinary other people, work is of intrinsic value to people with ASD in enabling them to express their interest and their skills in self-fulfilling ways (Baldwin et al., 2014). Work preference measures may be of limited value with low-functioning ASD who typically have significant language and communication problems than with high-functioning ASD, which speaks to a behavioral gradient influence of employment participation with ASD. With social inequality, the behavioral gradient is likely to be stacked against the individual with disabilities who will more likely be perceived to have impairment-related restrictions and limitations, which would be difficult to address with accommodations without causing undue hardship to prospective employers (Nesbitt, 2000).

Structural-Infrastructural Theory

Structural-infrastructural theory explains employment outcomes with disability in terms of accessibility

to labor markets, appropriateness and implementation of policy instruments for employment supports and protections with disability, and general material conditions of communities and neighborhoods. For instance, on the one hand, with a tight labor market, those with disability are at a greater risk of being squeezed out of the employment market due to implicit discrimination against them. This would likely be the case in times of national or regional economic recession in rural or small regional town communities with marginal rates of employment positions compared to urban and city locations. On the other hand, work participation with disability is enhanced with family support, access to services (Chen et al., 2015; Shattuck et al., 2011), and pro-work disability incentives that allow people with disability to retain their government-provided disability subsidy and protect themselves against the instabilities of the job market (Cimera & Burgess, 2011; Migliore et al., 2012). Early school-to-work transition support services provided to individuals with ASD at age 14 enhanced chances of securing employment post-school than similar services provided at age 16 (Cimera et al., 2013). Studies that examined the evidence for natural workplace support policies including coworker supports for increasing workplace integration with ASD fall within the domain of structural-infrastructural theory.

There are wide variations across US states and territories in the proportion of people with ASD with work participation in their communities (e.g., 17.44% Oklahoma vs. 65.45% Delaware; Cimera & Burgess, 2011; see also Burgess & Cimera, 2014), and it is unclear from the literature as to why this is so. Differences may be explained by types of state policies in place for employment support with ASD as by the implementation of state-level disability protection policy instruments. The differences among states in their successful placement of people with ASD might also be explained by the within-state social inequalities and that between state regions and localities. For instance, the proportion of people with ASD not in employment would be considerably higher in rural and low SES neighborhoods, likely due to the social inequalities on account of general scarcity of vocational rehabilitation services in those areas (Health Services Executive, 2012) as well as due to fewer job positions in those settings and lower employment supports to retain employ-

ment or improve job performance (Howlin, 2000). Sheltered facility employment is a more practicable employment option with significant disability in areas with fewer job opportunities and transportation problems compared to supported or competitive employment options (Milgiore et al., 2008).

Impoverished communities have lesser community-based social networks for employment opportunity and development (Granovetter, 1995). Social inequality due to deprivations in access to general amenities (e.g., transportation, healthcare services, social services, personal safety) diminishes employment opportunities in the communities or neighborhoods overall, and especially for people with a historical social disadvantage such as people with disability. Structural-infrastructural type theory would best explain employment outcomes with ASD by enabling an examination of latent social capital effects on employment outcomes with ASD (see also Milgiore et al., 2008).

Theory-Confluence in Explaining Employment Outcomes

Employment outcomes with ASD in any setting are likely explained by several theories, although the explanatory value of each of the theories may vary according to context, individual behavioral competencies, and the specific employment outcome. For instance, with high-functioning ASD (*a behavioral gradient variable*), work participation may depend more on the area-level employment opportunities and services available (*structural-infrastructural variables*) than on any other personal attribute (Howlin, 2000; Howlin Goode et al., 2004) or supported employment options (*behavioral-structural variable*; Wehman et al., 2012). Similarly, the policy implications of prioritizing each theory would be different. For instance, structural-infrastructural theory to understanding employment outcomes and ASD may lead to policy instruments to support vocational rehabilitation services at the likely neglect of the relational aspects of work participation as addressed by psychosocial theory-oriented evidence. Similarly, prioritizing psychosocial theory may lead policymakers to undervalue or overlook relevant structural-infrastructural factors behind social inequalities important for work participation with disability.

Suggestions for Further Research and Other Forms of Scholarship

Studies in the field of autism have the limitation to be overly focused on the biological and psychological levels on inquiry with a neglect of the social-ecological context of employment (Shattuch & Roux, 2015). This is a serious limitation to the related evidence in ignoring the influences of the area-level social inequality on employment participation. Poorly conceived or implemented employment support policy instruments for disability inclusiveness that ignore area-level social inequalities run the risk of harming the work participation of people with disabilities. Studies are needed that include social inequality variables to comprehensively address employment supports for people with ASD.

Vocational rehabilitation services are less well prepared to serve individuals with ASD (Chen et al., 2015; Nicholas et al., 2015; Wehman et al., 2012). Structural interventions such as inter-agency learning for greater coordination among adult service agencies (U.S. Government Accountability Office, 2012; Wehman et al., 2012, 2014), increased flexibility of employment participation supports over the life course (Barnhill, 2007), and increased understanding of ASD by service provider agencies (Griffith et al., 2011) may enhance employment participation for people with ASD. Research is needed on the design and implementation of robust supported community employment service models that bring together adults with ASD, their families, employers, business association boards, and adult service agencies, including vocational rehabilitation services, for better employment outcomes for adults with ASD.

Population-level studies are needed to complement the evidence from studies based on the NLTS2 and RSA-911 datasets. The NLTS2 dataset is limited in its evidence from having sampled only youth who received special education services during the data collection years from 2000 to 2009 and having excluded youths not with special education services or school enrolment during the data collection period. The RSA-911 is an annual, nationwide, individual-level database of the use of public vocational rehabilitation services to document case closure among other outcomes. It has an inherent limitation of not documenting outcomes for individuals who were unemployed when their cases

were closed and who may have found employment on their own later on (Cimera & Burgess, 2011). Evidence is needed from population-level studies to enhance the generalizability of findings to the general population with ASD taking into account variations in their habitats.

Studies have documented but not well explained the prevalent differences among US states and territories in the employment participation of people with ASD. There is a need for geospatial analysis to examine both between- and within-state differences in employment outcomes among cohorts of adults with ASD at the community level. Studies that employ area-level social inequality indicators to examine employment outcomes with ASD are particularly needed for their potential to yield the evidence needed for context-responsive employment supports for people with ASD.

CONCLUSION

This scoping review assessed the extent to which theory is used in any capacity in studies of employment outcomes and social inequality and ASD. Findings suggest that there is a dearth of extent of theory-led evidence in explaining employment outcomes with ASD, although the evidence for a particular theoretical basis would be important for the formulation of vocational rehabilitation support interventions for people with ASD. The preponderance of atheoretical studies risks uninterpretability of the evidence to guide policy and interventions aimed at supporting the work participation of people with ASD. Moreover, a lack of theory-informed evidence on employment participation with ASD runs the risk of a systematic underinvestment policy for the human, physical, health, and social infrastructure support for vocational rehabilitation of people with ASD. There is evidence to suggest that the availability of family and community supports (a structural-infrastructure variable) may explain employment outcomes with ASD more than could be predicted from impairment status (a behavioral variable) alone. Theory-led studies are needed to identify the specific factors that relate to employment outcomes for adults with ASD taking into regard area-level social inequality realities to better support these individuals to lead productive work lives.

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