



INTERNATIONAL ASSOCIATION OF  
REHABILITATION PROFESSIONALS

*The Rehabilitation Professional*

---

Volume 25 Number 1 • 2017

# The Rehabilitation Professional

The Official Journal of the International Association of Rehabilitation Professionals

---

**Theodore Scott Smith, PhD**

*Editor*

University of Louisiana at Lafayette  
P.O. Box 40121, Psych Dept  
Lafayette, LA 70504  
tss1065@louisiana.edu

**Wesley A. Austin, PhD**

*Managing Editor*

University of Louisiana at Lafayette  
P.O. Box 44570  
Lafayette, LA 70504  
waustin@louisiana.edu

---

## Editorial Advisory Board

- Dr. Scott F. Beveridge**, The George Washington University, (202) 994-2473, [beveridg@gwu.edu](mailto:beveridg@gwu.edu)  
**Mr. Thomas E. Bott**, Thomas E. Bott and Associates, (225) 767-3024, [thomasbott@msn.com](mailto:thomasbott@msn.com)  
**Dr. Martin Brodwin**, Cal State Univ. LA, (323) 343-4440, [mbrodwi@calstatela.edu](mailto:mbrodwi@calstatela.edu)  
**Dr. William Darling**, Darling Rehabilitation, (614) 888-3646, [darlingrehab@aol.com](mailto:darlingrehab@aol.com)  
**Dr. Judi Drew**, Vocational Works, (401) 475-1610, [jdvocworks@msn.com](mailto:jdvocworks@msn.com)  
**Dr. Patrick L. Dunn**, University of Tennessee, (865) 687-7054, [pdunn4@utk.edu](mailto:pdunn4@utk.edu)  
**Dr. Kristy Farnsworth**, Farnsworth & Associates, (801) 572-5633, [kfar@mission.com](mailto:kfar@mission.com)  
**Dr. Angela M. Heitzman**, Heitzman Rehabilitation, LLC, (952) 924-9028, [angela@heitzmanrehab.com](mailto:angela@heitzmanrehab.com)  
**Ms. Cloie B. Johnson**, OSC-Vocational Systems, [cloie@osc-voc.com](mailto:cloie@osc-voc.com)  
**Dr. Craig Johnston**, Northeastern IL University, (773) 442-5554, [johnstonvoc@sbcglobal.net](mailto:johnstonvoc@sbcglobal.net)  
**Dr. Robert Mosley**, (216) 233-8754, [ramtws@aol.com](mailto:ramtws@aol.com)  
**Dr. James R. Newton**, J. Rubin & Associates, (770) 789-9987, [james.newton@me.com](mailto:james.newton@me.com)  
**Dr. Jamie L. Pomeranz**, University of Florida, (352) 273-6745, [pomeranz@ufl.edu](mailto:pomeranz@ufl.edu)  
**Dr. Rick Robinson**, Robinson Work Rehabilitation, (904) 712-4419, [rick@rwrehab.com](mailto:rick@rwrehab.com)  
**Dr. Michael Shahnasarian**, Career Consultants of America, (813) 265-9262, [shahnasa@aol.com](mailto:shahnasa@aol.com)  
**Dr. Larry Stokes**, (504) 454-5009, [lstokes@lstokesphd.com](mailto:lstokes@lstokesphd.com)  
**Mr. Robert H. Taylor**, Vocational Diagnostics, Inc., (602) 285-0625, [MB280sl1987@gmail.com](mailto:MB280sl1987@gmail.com)  
**Dr. Roger A. Thrush**, Roger A. Thrush, Inc., (619) 465-2784, [rthrush@rogerthrush.org](mailto:rthrush@rogerthrush.org)  
**Dr. Molly Tschopp**, Ball State University, (765) 285-8040, [mkttschopp@bsu.edu](mailto:mkttschopp@bsu.edu)
- 

The Rehabilitation Professional is published quarterly by the International Association of Rehabilitation Professionals (IARP). The Rehabilitation Professional is published to promote the profession, to inform the public about activities of the organization, and to create responsible debate and discussion of relevant issues germane to the profession. The Rehabilitation Professional is distributed to all members of IARP as a benefit of membership and is available through subscription to others interested in the activity of IARP.

**Subscription Pricing:** IARP Member — e-access no charge, included in dues; one print copy of each issue annual charge is \$25.  
Non-IARP Professional — e-access only four issues \$60; e-access and one print copy of each issue \$85.  
Institutional — e-access only \$125; e-access and print copy of each issue \$150.

© International Association of Rehabilitation Professionals, 2017. All rights reserved. No part of this publication may be reprinted, stored, or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without written permission from the publisher. Articles and papers published in the Journal reflect the opinions of the author(s) and do not necessarily represent the official views of IARP.

# The Rehabilitation Professional

Volume 25 ■ Number 1 ■ 2017

---

**3 Editorial: Where Have all the Scholars Gone?**

*Theodore Scott Smith*

**Articles**

**5 A Longitudinal Study of Attitudes Toward Disability Among Rehabilitation Counseling Students**

*George Mamboleo, Zornitsa Georgieva, Charlene M. Kampfe, and S. Mae Smith*

**13 Age-Earning Profiles: Refinement and Application**

*David S. Gibson and Erin P. Gibson*

**35 Invisibility of Domestic Violence Among Persons with Disabilities in Human Service Professions**

*Sheri K. Anderson and Patrick L. Dunn*

**43 Monograph: Psychometric Protocols for Psychological, Educational, and Vocational Testing for Persons with Blindness and Visual Impairments**

*Theodore Scott Smith and Charles E. Taylor*

**51 Bullying, Students with Disabilities, and Recommendations for Prevention of Bullying**

*Emily J. Hernandez, Martin G. Brodwin, and Frances W. Siu*

**59 Worklife Expectancy and Disability in the Forensic Arena: A Response to Chapter 20 “Worklife Expectancy Models and Concepts” in Rick Robinson’s *Foundations of Forensic Vocational Rehabilitation***

*Enrique N. Vega and Joseph T. Crouse*

**67 Memorium to Dr. Amos Sales**

*Theodore Scott Smith*

*Special Offer for IARP Members*

## **New Healthcare Cost Resource for Life Care Planning**

**Easy-to-use online search tool puts cost information at your fingertips.**

IARP is pleased to launch a new program to make healthcare cost information available to its members at discounted rates. IARP wants to make it as easy as possible for members to confidently develop plans based on reliable, robust geographically-specific information about future healthcare expenses.

That's why we have teamed with FAIR Health, Inc., an independent, nonprofit maintaining the country's largest, most trusted repository of privately billed medical and dental charge data to bring reliable cost information to your desktop—**through a special, discounted licensing arrangement.**

FAIR Health's online tool and the data that support it are:

- **Convenient.** Makes cost data accessible to you through an easy-to-use online tool—enabling you to quickly create a customized healthcare cost profile and resulting in considerable savings to you in both cost and time.
- **Flexible.** Enables you to easily conduct a new cost search and update your plan whenever your client's healthcare needs change.
- **Comprehensive.** Offers charge data for professional and facility codes for medical-surgical, dental, anesthesia, inpatient, outpatient, ambulatory surgery center and HCPCS services (including ground and air ambulance services).
- **Representative.** Features benchmark charges based on data from many of the nation's largest health plans and payors that cover more than **150 million** individuals.
- **Geographically specific.** Provides granular local data for 493 three-digit zip regions nationwide.
- **Affordable.** Flexible packages are available starting at just \$385. Ask about bulk discounts.

For personalized service, contact Jeff Newbauer at FAIR Health. Jeff worked closely with IARP to develop the program and can help you get started.

**Jeff Newbauer**  
**FAIR Health Account Manager**  
**[jnewbauer@fairhealth.org](mailto:jnewbauer@fairhealth.org)**  
**(440) 247-5720**

This program is only available to members of IARP.

## Editorial: Where Have all the Scholars Gone?

The field of vocational rehabilitation, and indeed the field of counseling itself are both going through remarkable changes, albeit not necessarily for betterment of the profession at present. Many happenings are occurring currently that affect the profession. First, the CORE/CACREP controversy is watering down the singular identity of the profession. Second, many national organizations dedicated strictly towards the professional of rehabilitation counseling are struggling not only regarding maintenance of membership, but also financially, and diffusion of identity. Third, funding for rehabilitation graduate programs is dwindling or has been ceased, with many programs over the past decade, unfortunately, reaching closure status. Fourth, and specifically relevant to the present narrative, the tenacity of the scholar, practitioner has dwindled, warranting further discussion.

In the past, many scholars, practitioners existed in the field of vocational rehabilitation. These individuals were very productive in practice, across both forensic and public sectors. As a component of practice, people would reflect on case studies, seek Institutional Review Board approval for potential studies, and then seek publication avenues for their efforts. As a result of these efforts, the field of vocational rehabilitation was able to successfully support many journals: *Journal of Rehabilitation*, *Applied Rehabilitation Counseling*, *Rehabilitation Counseling Bulletin*, *Rehabilitation Professional*, among others. However, lack of better expression, “The times, they are a changin’.” More specifically, the vivacity of scholarship in rehabilitation counseling has changed, with a challenge for the profession to maintain publishing and scholarship. Moreover, it is important to acknowledge that these judgments do not encompass all. As an example, Mary Barrios Bailey, Rick Robinson, Scott Beveridge, Patrick Dunn, Steve Koobatian, and many current scholars are publishing consistently, and their works should be applauded. (For those that I missed, I humbly apologize.)

At present, many journals in the field of vocational rehabilitation have been completely terminated, suspended, or furthermore unable to maintain consistent issues. In other professions, such as psychology, the field is seeking expansion of journals, as opposed to the latter. Anecdotally, the field of rehabilitation counseling is expanding, with vocational rehabilitation professionals being used for a variety of purposes, with current expansions and applications towards the rehabilitation of prisoners and also returning veterans. However, the expansion of the field has not

translated into promotion of scholarship, specifically, research. Many reasons may justify these current trends.

First, current practitioners are focusing on billing, as opposed to long-term development of the profession, as reflected in the paucity of current research. Admittedly, receipt of money makes life easier—paying bills, sending kids to college, enjoying vacations, among others. However, current practitioners must consider the short-term and long-term implications of only assuring that billing is maximized. From a short-term stance, other practitioners are not aware of current progressions in the field and clients cannot benefit from dissemination of this knowledge. Regarding long-term losses, the field lacks a collective foundation or progression of knowledge, essentially leaving the field stagnant.

Second, the lack of scholar, practitioners is the result of fewer graduates from rehabilitation counseling programs. Within naming specific schools, it is easy to acknowledge that many graduate programs have been closed over the last decade. As a result of these closures, it make sense that there are similarly fewer graduates, and then, with fewer graduates, less individuals are publishing and seeking opportunities to publish their thoughts and research. However, reduced numbers should not entirely necessitate the extent of fewer submissions and reduced scholarship. As such, other reasons must be examined.

Third, current graduate programs are focusing on the “practice” of rehabilitation counseling and no necessarily the “scholarship” of the profession. With the merger of the credentialing bodies, it is acknowledge that curriculum development woes are inevitable. Efforts may be taken to develop counseling skills and practice, with limited focus on research and publishing, particularly at the graduate-school level. It would be encouraged for programs to prompt both sets of skills, perhaps in the future facilitating further research initiatives.

Fourth, current practitioners are weary of writing formalized papers, with the goal of eventual publication. Admittedly, I am both a practitioner and academician, in which I am comfortable with both writing styles. From my perspective, both writing styles are synchronous, as opposed to competitive. If someone can write a report, the same person can write a paper for publications, or at least from my perspective this seems to be true. If this is the case, in future issues of *Rehabilitation Professional* I will set up a Writers’ Corner section, in which I will discuss tidbits of writing, such as APA format, development of ideas, and other poten-



tial prompts to facilitate the traditional practitioner-only to begin the writing process.

Fifth, and lastly, current practitioners do not foresee the need for publications within the field. Bluntly, and I recognize this will most probably be harsh for most, this attitude is both naïve and selfish. Oftentimes, I will contact individuals to either review articles or submit articles and I get several responses, such as too little time; their practice is thriving, minimizing the need to publish; they published three years ago, and do not need additional publications; that publishing is someone else's responsibility; an identified primary goal is on only billing; a liability for one's private practice; and, others. A key feature to any profession is its research—a stagnant profession cannot stand and will indeed fall without continuous research. Apathy for scholarship will certainly result in the demise of a profession, and the field of rehabilitation counseling cannot suffer this death.

While I have discussed the concerns, I assess that I must similarly discuss the potential solutions. (After all, it is always important to end on a good note and positive tune.) These solutions will be applied to *Rehabilitation Professional* over the next year, and potentially may be modified as time progresses. The current model for the journal, admittedly, is not working. Most journals will have open submissions, in which individuals will submit potential publications then various articles will be accepted, rejected, or further processed. The present journal is receiving submissions; however, the submissions are either generally poor, or not deserving of publication, or are generally set up for sole promotion of a product or facility, in which does not meet the mission of the journal. As such, alternative models must be discussed. The following ideas are submitted as potential solutions:

- It is my opinion that the journal must incorporate articles and submissions from the individual interest groups through IARP. I will set a goal for each interest group to be responsible for one article per year, encompassing not only responsibility for the interest group leaders, but also a service for the interest group members.
- I want to begin to incorporate a Report Example within each issue. I am hopeful that the journal will be used for educational purposes. Offering report examples will offer membership an example of national work products and also enable students a template for their proposed work products following graduation.
- The value of Continuing Education Units must be maximized for IARP members. In future issues 2 Units will be offered, covering basic issues such as various types of disabilities, law, and legislation, therapeutic modalities, among others.

- I want to begin to have with each issue a Student Paper. As a student I remember my first paper reaching publication status. It was indeed an accomplishment. I want students to have this satisfaction. As such, I will seek educators to submit student papers on current, relevant topics.

It is acknowledged in 2016 that only two issues of *Rehabilitation Professional* were published. From one stance, considering other journals in the field submitted no issues, this represents an accomplishment. However, from another framework, the journal has a history of publishing four issues a year, and it is my opinion that this standard must be maintained. As such, in 2017 I hope to regroup and successfully publish four issues with the aforementioned goals accomplished.

Theodore Scott Smith  
 Editor, *The Rehabilitation Professional*  
 University of Louisiana at Lafayette

# A Longitudinal Study of Attitudes Toward Disability Among Rehabilitation Counseling Students

**George Mamboleo, Zornitsa Georgieva,  
Charlene M. Kampfe, and S. Mae Smith**

The purpose of the present study was to determine the extent to which a two-year master's program in rehabilitation counselor education was associated with change in the students' attitudes toward disability and persons with disabilities at a Southwest University in the U.S. using the Modified Issues in Disability Scale (MIDS) (Makas, 1991). There were 101 complete pretest surveys and 53 completed posttest surveys. Only those with complete data both at pretest and posttest were included in the study. Data were collected in a span of six years beginning Fall 2002 to Fall 2008. Results revealed a significant increase or improvement in attitudes among the students from pretest to posttest. Furthermore, students' attitudes increased across the board for both traditional and distance learners, revealing that both types of enrollment were suitable for the students. An exploratory examination indicated that students who had no prior experience working with disabilities possessed less positive attitudes toward individuals with disabilities, and these attitudes are modifiable with exposure to graduate training protocols. The results of the study reveal that successful matriculation through an identified rehabilitation counseling program facilitates better attitudes among counselors-in-training within the context and limitations of the present study.

*Keywords:* attitudes toward disability, rehabilitation counselor education, distance learners, pretest, posttest

Negative attitudes present significant challenges that prevent individuals with disabilities from achieving rehabilitation goals, hinder their inclusion in society, and allow impairments to become handicaps (Antonak & Livneh, 2000; Chan, Tarvydas, Blalock, Strauser, & Atkins, 2009; Vilchinsky & Findler, 2004). Furthermore, negative attitudes toward disabilities lead to poor access to public services; few opportunities for a broad range of human endeavors (Gordon, Feldman, Tantillo, & Perrone, 2004; Hergenrather & Rhodes, 2007; Martin, Rowell, Reid, Marks, & Reddihough, 2005; Palmer, Redinius, & Tervo, 2000); may influence service professionals' interpersonal relationships, quality of care, service delivery, and allocation of resources (Martin et al., 2005; Palmer et al., 2000); and can even have a detrimental effect on quality of life (Aggarwal, 2012). For these reasons, the study of attitudes toward disability continues to be an important research topic in rehabilita-

tion counseling (Bodwin & Orange, 2002; Chen, Brodwin, Cardoso, & Chan, 2002; Parashar, Chan, & Leirer, 2004; Rosenthal, Chan, & Livneh, 2006; Wang, Thomas, Chan, & Chieng, 2003; Wong, Chan, Cardoso, Lam, & Miller, 2004). Exploration of attitudes toward individuals with disabilities held by rehabilitation counseling trainees is important because these professionals' negative attitudes have the potential to affect the quality of services they provide as well as interfere with rehabilitation outcomes (Brodwin & Orange, 2002; Rosenthal et al., 2006).

Rehabilitation professionals, similar to the general population, are probable to be affected by negative societal attitudes toward individuals with disabilities (Cook, 1998; Rosenthal & Berven, 1999). It is important for rehabilitation counselors to better understand the effect of negative attitudes toward individuals with disabilities in order for them to develop appropriate interventions and programs that can be

used by stakeholders to change negative attitudes toward the individuals they serve (Antonak & Livneh, 2000; World Health Organization & World Bank, 2011).

### Academic and Clinical Preparation

Specific academic experiences and preparation are necessary to promote positive attitudes. For example, training programs can help students learn about disabilities and to develop positive attitudes through class discussions, lectures, role-plays, and experiential learning (Sahin & Akyol, 2010). For example, rehabilitation majors who had received clinical training had significantly more positive attitudes toward people with disabilities than those without those opportunities (Hunt & Hunt, 2000). Likewise, occupational therapy majors increased their positive attitudes toward disabilities within their first year experience of academic curriculum which consisted of university teaching and clinical placements (Chan, Lee, Yuen, & Chan, 2002).

Yadav, Arya, Kataria, and Balhara (2012) examined the impact of psychiatric training and education on medical students' attitudes toward persons with mental disorders. They found significant differences in attitudes between interns and students from different professional years, such that medical interns were less likely to hold stigmatizing attitudes and were more comfortable in having interactions with those with mental disorders than students with less academic training. The results suggest that an increase in years of education may influence positive attitudes and behaviors.

Regarding short-term training and attitudes, extant literature suggests a positive change in attitudes toward individuals with disabilities when participants are exposed to such training. For example, in a study analyzing the effectiveness of a training intervention for medical students, Martin et al. (2005) found a small but significant positive relationship between training and positive attitudes toward cerebral palsy after watching a video produced to educate people about the disability. In an experimental design, Hunt and Hunt (2004) found that business students who received a presentation regarding persons with disabilities had more positive attitudes than those who did not receive the presentation.

**Contact with Disability.** Significant positive relationships between contact with people with disabilities and attitudes toward disabilities have been reported in the literature. For example, Choi and Lam (2001) found a significant positive correlation between individuals' prior exposure to a person with a disability and attitudes toward disability among Korean and Korean American students. Miller, Chen, Glover-Graf, and Kranz (2009) found that students

who currently had a relationship with a person with a disability indicated that they were more willing to have relationships with persons with disabilities than those who did not have a current relationship. In a study examining the influence of casual and familial contact with disability on a person's attitude toward disability, Budisch (2004) found that undergraduate students who had more contact with people with disabilities had more positive attitudes toward disabilities than those with less contact. Similarly, in a study of undergraduates from a large university in Southwest U.S., students who indicated that they had more experience with individuals with disabilities also had more positive attitudes about interacting with people with disabilities, more positive general attitudes toward disability, greater sense of comfort with people with disabilities, and less fear about being with people with disabilities than students with less experience with persons with disabilities (Thomas et al., 2003). Tervo, Palmer, and Redinius (2004) found that graduate and undergraduate students in health professions who had a background in disability studies demonstrated more positive attitudes toward disability than did students who did not have such a background. In another study, Meyer et al. (2001) found that students who had interviews with people using wheelchairs had more positive attitudes toward disability than those who did not have such interviews. Tervo et al. (2004) found that health professionals with work experience had higher comfort levels with persons with disability than those with less experience. Hernandez, Keys, and Balcazar, (2004) found that individuals from the private and public sector who had prior work history with people with disabilities, either as employers or as service providers, had more positive attitudes toward the ADA and disability rights than did individuals who had no work experience with this population. Likewise, Herbert (2000) found that therapeutic program staff with more years of work experience were more comfortable when working in programs for persons with disabilities than those with less experience.

The review of the literature did not yield longitudinal studies on attitudes toward people with disabilities among students in rehabilitation counselor programs. The closest study was a pre-post study of nursing students' attitudes toward individuals with disabilities which revealed significantly more positive attitudes at the completion of their senior year (Thompson, Emrich, & Moore, 2003). As such, this study will address this important, but largely unexplored, issue, with applications towards rehabilitation counselor education, and broader implications towards reduction of negative attitudes towards persons with disabilities.



## Purpose of the Study

The purpose of the present study was to determine the extent to which a two-year master's program in rehabilitation counselor was associated with change in master's level students' attitudes toward disability at a Southwest University in the U.S.

The study sought to answer the following three research questions.

1. Is there change from pretest to posttest in attitude scores among masters' level rehabilitation counselor education students as measured by the Modified Issues in Disability Scale (MIDS)?
2. Is there a difference in attitude change among on campus and distance education learners in a counselor education program?
3. Is there a difference in attitude change among employment status groups (i.e., working with persons with disabilities and not working with persons with disabilities) in a counselor education program?

## Method

### Participants

The participants were students completing a two-year masters' program in rehabilitation counselor education at large university in the Southwestern U.S. The program entailed coursework in disability and a clinical placement at an agency that provided services to individuals with disability. There were 101 complete pretest surveys and, of these, only 53 had complete posttest data. Only those with complete data both at pretest and posttest were included in the study. The average age of participants was 46.6 years ( $SD = 11.72$ ) ranging from 28 to 69 years ( $SD = 11.72$ ). The majority of the participants were female (68%). Regarding racial affiliation, the majority (66%) reported they were White, with others reporting Hispanic (15%), Native Americans (6%), Asian (6%), Black (4%), and other races (4%). The majority (66%) of participants indicated they did not have a disability. Fifty-three percent said they were in a marriage relationship, while 42% indicated they were single. Four percent were in other relationships, while one participant did not answer this question. Regarding employment, the majority (72%) indicated they were working with individuals with disabilities while 26% indicated they were not working with these individuals. Two percent did not answer this question.

### Data Collection Instruments

**Demographic data.** A demographic questionnaire was developed to measure participants' personal and contextual variables such as age, gender, race, enroll-

ment type (i.e., on-campus or distance), disability status, marital status, work, and employment (i.e., whether working individuals with disabilities).

**The Modified Issues in Disability Scale (MIDS) (Makas, 1991).** The MIDS utilizes a Likert-type scale in which subjects are asked to indicate their extent of agreement/disagreement with 37 statements about persons with physical disabilities. MIDS responses range from 1 = strongly disagree to 7 = strongly agree, where 4 is an indication that the participant does not know or has no opinion. The MIDS scale ranges from 37 (least positive) to 259 (most positive). This scale was chosen because of administration ease and its tested reliability and has strong content validity. Analyses of responses to the MIDS of 305 undergraduate students (170 females, 135 males) yielded a Cronbach alpha of .79. Two predicted differences existed that support the MIDS's construct validity: females scored significantly higher ( $M = 167.31$ ) than males ( $M = 161.03$ ),  $F(1, 303) = 7.65, p < .01$ ; and subjects with greater personal contact with individuals with disabilities scored significantly higher than participants with less personal contact,  $F(4, 300) = 3.54, p < .01$ . Furthermore, the MIDS's criterion validity was supported by a significant correlation between MIDS scores and scores on Yunker & Block's (1986) Attitudes Toward Disabled Persons scale, the ATDP ( $r = .78, p < .001$ ) in a subsample of 225 subjects who had completed both measures. The MIDS differs from similar measures in that the item selection relied heavily on input from people with disabilities (Makas, 1991).

### Procedures

The study received approval from the Institutional Review Board at the University, and participants provided consent by reading and signing the informed consent form developed by the institution. Pre-test data were collected by a graduate assistant at the beginning class, usually in the fall semester during orientation. Post-test data were collected at the end of the two-year sequence of classes during the last day of on campus class. Data were collected in a span of six years beginning Fall 2002 and ending Fall 2008.

### Data Analysis

Data processing was undertaken to edit, code, and tabulate data in preparation for statistical analysis using the Statistical Package for Social Sciences (SPSS). Descriptive statistics (frequency distributions, means, and standard deviations) were computed for demographic variables. Significance level was set at  $p < .05$ . Average attitude scores were normally distributed based on the Shapiro-Wilk test. Cronbach's alpha was .82 across items on the MIDS instrument. Instrument internal consistency reliability indices of 0.70 or greater are considered adequate

(Armstrong & Swartzman, 1999; De Vaus, 2002). Therefore, adequate reliability for the MIDS was established for present study. The Paired sample *t*-test was used to establish the general change of attitudes between pre-test and post-test. A mixed-model analysis of variance (ANOVA) was conducted to examine the change in the participants' attitudes, as measured by the (MIDS), and any possible differences in attitude change between on-campus and distance learners.

## Results

### Research Question 1: Is there a change from pretest to posttest in attitudes scores among masters' level rehabilitation counselor education students?

The results indicated there was a significant increase in scores for attitudes from pretest ( $M=201.16$ ,  $SD=19.34$ ) to posttest ( $M=207.81$ ,  $SD=17.82$ ),  $t(52)=-2.802$ ,  $p=0.007$  using paired sample *t*-test. Students' attitudes increased slightly in the course of their matriculation through the two-year sequence of study.

### Research Question 2: Is there a difference in attitude change among on campus and distance education learners in a counselor education program?

A mixed-model ANOVA utilized a within-subjects factor of training (pretest and posttest) and between-subjects factor of group (on-campus versus distance learn-

ers). There was a significant main effect of training (pretest and posttest) at  $F(1,51)=9.25$ ,  $p<.05$ , partial  $\eta^2=.15$ . The observed power was .85. There was no significant main effect of group and the group-by-training interaction was not significant. The lack of an interaction effect indicates that both on-campus and distance learners followed a similar pattern of change in attitudes from pretest to posttest (see Figure 1). The distance learners (i.e., those with experience working with individuals with disability) with higher scores ( $M=205.78$ ,  $SD=18.96$ ) in comparison to on-campus learners ( $M=194.14$ ,  $SD=18.16$ ). Both groups reported higher mean scores following the training. The mean score of the distance learners reported a posttest score was 209.88 ( $SD=14.96$ ) while the on-campus learners reached 204.67 ( $SD=21.48$ ). It is important to note that the initial scores for both groups were relatively high considering the highest possible MIDS score was 259. Homogeneity of variance was the only ANOVA assumption violated, but ANOVA is robust to violations of this assumption.

### Research Question 3: Is there a difference in change in attitudes among employment status groups (i.e., working with persons with disabilities and not working with persons with disabilities) in a counselor education program?

As indicated earlier, the majority (72%) of participants worked with individuals with disabilities. Because of insufficient sample size for individuals not working with people with disability, the effect of working with people with disability was not investigated through inferential statistics. Nevertheless, an

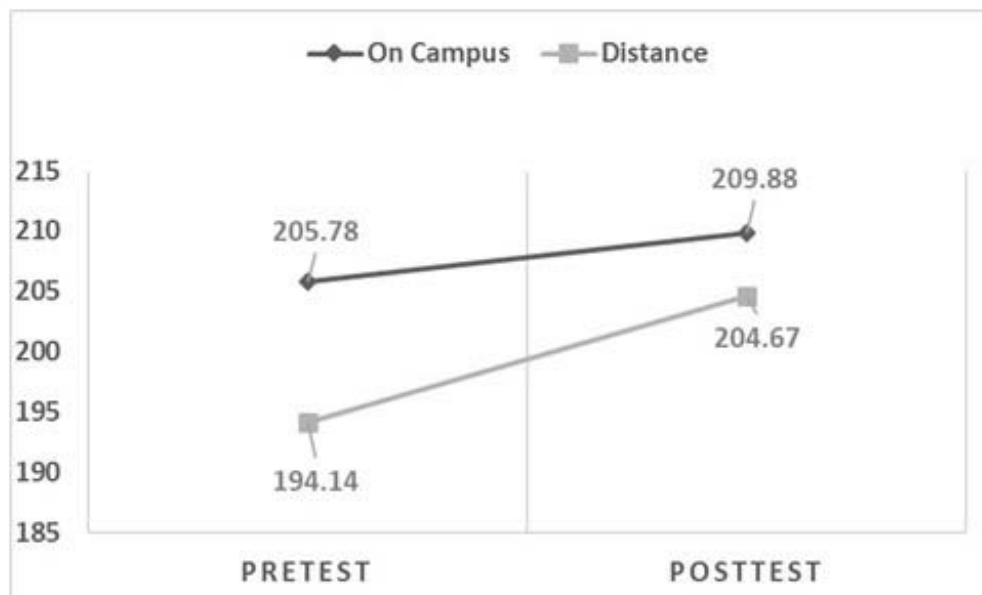


Figure 1. Mean MIDS Pretest and Posttest Scores Reported by On-Campus and Distance Learners

exploratory examination of mean scores showed that participants who did not work with people with disabilities had less positive attitudes at the beginning of the training ( $M=192.00$ ,  $SD=19.40$ ) in comparison to participants who worked with people with disabilities ( $M=204.13$ ,  $SD=19.17$ ). Upon completion of the training the average score of the participants who did not work with people with disabilities prior to entering training increased to 204.36 ( $SD=17.97$ ). The average posttest of participants who worked with people with disability was 208.92 ( $SD=17.77$ ).

## Discussion

Students' attitudes towards disabilities improved significantly in the course of their matriculation through the two-year rehabilitation counseling masters' program. These findings are consistent with those of Thompson et al. (2003) who found that nursing students' attitudes toward disability improved at the completion of their senior year. The findings also validate studies that have shown that participation in academic programs can improve students' positive attitudes (Chan, Lee, Yuen, & Chan, 2002; Hunt & Hunt, 2000; Sahin & Akyol, 2010; Yadav, Arya, Kataria, and Balhara, 2012). Furthermore, based on these findings we might infer that experience in disability through participating in a training intervention (Martin et al., 2005) or by taking part in a presentation about disabilities (Hunt & Hunt, 2004) serves to enhance positive attitudes among participants. Although the participants' attitudes were positive when they entered the program, they graduated with more positive attitudes. We might infer that students' learning experiences throughout the program helped them mature in the manner in which they viewed individuals with disabilities. In other words, successful matriculation through the rehabilitation counseling program might help inculcate positive attitudes among rehabilitation counselor education students. This is important because counselors' positive attitudes toward individuals with disabilities are directly related to positive client outcomes (Garske & Thomas, 1992). Furthermore, positive attitudes communicate acceptance, a critical component for successful intervention outcomes (Herbert, 2000).

Both on-campus and distance learners followed a similar pattern of change in attitudes from pretest to posttest. The distance learners started with higher scores in comparison to the on-campus learners. Both groups reported higher mean scores following the training than they did prior to the training. These findings are consistent with researchers who have reported no significant differences between the two in terms of academic performance (Carey, 2001; Dell, Low, & Wilker, 2010; Johnson et al., 2000; Kekkonen-Moneta, 2000; Stizmann, Kraiger, Stewart & Wisher, 2006). These findings might be interpreted

to mean that both groups of students benefited equally throughout their matriculation in terms of acquisition of positive attitudes toward individuals with disabilities.

There is evidence that rehabilitation majors may have more positive attitudes than people from other areas of academic focus (Hunt & Hunt, 2000; Miller et al., 2009), which is consistent with the generally high initial attitudes we observed. In the present study, attitudes of rehabilitation counselor education students who were working with individuals with disabilities and those not working with this population were compared. However, because most participants were working with this population at the time of the study, the effect of working with people with disability was not investigated through inferential statistics. Nevertheless, an exploratory examination of mean scores showed that at the beginning of the training, participants who did not work with people with disabilities had less positive attitudes compared to participants who worked with people with disabilities, and upon completion of the training both groups' attitudes increased.

## Implications for Education

The attitudes of rehabilitation counseling students increased as they matriculated through the two-year sequence of study. Furthermore, attitudes for both on campus students and distance education students (i.e., those with experience working with individuals with disability) increased from pretest to posttest. From these results, we infer that education influenced attitudes for both groups consistent with the literature cited elsewhere in the text. The aim of the rehabilitation counseling program is to train qualified rehabilitation counselors, and that training seems to have had a positive influence on their attitudes toward persons with disability. The implication of these findings is that the rehabilitation counselor education program fostered an environment for development of positive attitudes towards people with disabilities among the students. Furthermore, students seemed to benefit equally across categories regardless of the type of enrollment. Students entering this masters' rehabilitation program seemed well suited for the program. They entered the program with positive attitudes that improved further at completion of program. These findings are indicative of the role counselor education plays in enhancing positive attitudes toward disability among trainees.

## Implications for Practice

Findings from this study have several important implications for practice. First, results indicate that graduates of the rehabilitation counseling program increased their positive attitudes by the time of gradu-



ation. This is important because positive attitudes indicate that counselors have developed acceptance which is an important ingredient of their work (Herbert, 2000). This means that they may be well suited for their work with individuals with disabilities.

Second, results from this study indicate that participants who entered the program as distance education students benefited the same way as did the on campus students. Distance education is quickly becoming a trend in university classroom instruction (Beard, Harper, & Riley, 2004; Collins, Baird, & Hager, 2009) and is altering personnel preparation practices in special education (Collins et al., 2009). However, it has been reported that distance education students might experience some disadvantages compared to on-campus students (Khawaja & Stallman, 2011). For example, on-campus students have easy access to library resources and computer laboratories as well as easier access to student support services and greater opportunities for face-to-face interaction with lecturers and peers (Lebowitz, 1997). However, results from this study indicate counselors' attitudes increased evenly across both groups. Graduates from both types of enrollment seem suitably prepared to work with individuals with disabilities owing to their positive attitudes.

Third, based on exploratory examination, participants who had worked with individuals with disabilities on entrance to the program exhibited more positive attitudes at pretest than those who did not have such experience. Furthermore, their attitudes increased significantly at posttest. The attitude increase could be an indication that their experiences through contact with individuals with disabilities at work may have contributed to the positive attitudes. These findings support the literature regarding positive relationships between contact with people with disabilities and attitudes toward disabilities (Choi & Lam, 2001; Herbert, 2000; Hernandez, Keys, & Balcazar, 2004; Miller, Chen, Glover-Graf, & Kranz, 2009; Tervo, Palmer, & Redinius, 2004; Meyer et al., 2001). Furthermore, the improved posttest test scores for the distance education learners could be an indication that even those counselors in the field who possess positive attitudes can improve with academic training.

### Future Research

Future longitudinal research in this area should aim to broaden the population of study to include more rehabilitation education programs to understand change in attitudes over time. Participants who were already working with individuals with disabilities seemed to possess positive attitudes compared to those who did not work with this population at the beginning of their education. It might be inferred that prior contact with individuals with disability through work might have influenced their positive attitudes. Further studies with more people in both groups is

warranted to unravel the reasons behind the positive attitudes observed among these types of participants. Finally, there is need for research that will follow students into the workplace to evaluate how training impacts attitudes post education.

### Limitations

The present study was completed at a single institution of learning in the Southwest U.S. and results may not be generalizable to other institutions of learning. Furthermore, in longitudinal studies such as the present study, many of changes take place within an individual between pretest and posttest due to life and work experiences. This might have affected individuals' responses, a situation that makes it difficult to pinpoint causality. Because of attrition, many participants who participated during pretests could not be found to complete posttests, which partially explains why there were fewer posttest surveys completed compared to those completed during pretest. Also, since no measure of social desirability was used, there is no way to know the extent that social responding influenced the results. Finally, although the authors infer that the rehabilitation program training was responsible for the changes in attitudes, since there is matched sample from other types of majors, other factors such as maturity and more contact with persons with disability might have contributed to the attitudes changes observed in the findings.

### Conclusion

Results from the present study revealed a significant increase in attitudes among counselors in training from pretest to posttest. Although their attitudes were high when they entered the program, those attitudes increased exponentially by the time the students graduated. Furthermore, students' attitudes increased across the board between traditional and distance learners revealing that both types of enrollment were suitable for the students. Finally, exploratory examination indicated that students who had no experience working with disabilities possessed less positive attitudes toward individuals with disabilities. This might confirm past research that contact with disability increases positive attitudes.

### References

- Aggarwal, N. R. (2012). Attitudes of students towards people with mental ill health and impact on learning and well-being. *Journal of Research in Special Educational Needs, 12*(1), 37–44.
- Antonak, R. F., & Livneh, H. (2000). Measurement of attitudes towards persons with disabilities. *Disability and Rehabilitation, 22*(5), 211–224.

- Armstrong, T. L., & Swartzman, L. C. (1999). Asian versus western differences in satisfaction with western medical care: The mediational effects of illness attributions. *Psychology and Health, 14*, 403–416.
- Beard, L. A., Harper, C., & Riley, G. (2004). Online versus on-campus instruction: Student attitudes and perceptions. *TechTrends: Linking Research and Practice to Improve Learning, 48*(6), 29–31.
- Brodwin, M. G., & Orange, L. M. (2002). Attitudes toward disability. In J. D. Andrew & C. W. Faubion (Eds.), *Rehabilitation Services: An introduction for the Human Services Professional* (pp. 145–173). Osago Beach, MO: Aspen Professional Services.
- Budisch, K. (2004). Correlates of college students' attitudes toward disabilities. *Journal of Undergraduate Research, 72*(1), 1–5.
- Chan, C. C. H., Lee, T. M. C., Yuen, H. K., & Chan, F. (2002). Attitudes towards people with disabilities between Chinese rehabilitation and business students: An implication for practice. *Rehabilitation Psychology, 47*(3), 324–338.
- Chan, F., Tarvydas, V. M., Blalock, K., Strauser, D., & Atkins, B. (2009). Unifying and elevating rehabilitation counseling through model-driven, diversity-sensitive evidence-based practice. *Rehabilitation Counseling Bulletin, 52*(2), 114–119.
- Chen, R. K., Brodwin, M. G., Cardoso, E., & Chan, F. (2002). Attitudes toward people with disabilities in the social context of dating and marriage: A comparison of American, Taiwanese, and Singaporean college students. *Journal of Rehabilitation, 68*(4), 5–11.
- Choi, G., & Lam, C. S. (2001). Korean students' differential attitudes toward people with disabilities: An acculturation perspective. *International Journal of Rehabilitation Research, 24*(1), 79–81.
- Collins, B. C., Baird, C. M., & Hager, K. D. (2009). The University of Kentucky distance education program in moderate and severe disabilities. *Rural Special Education Quarterly, 28*(3), 30–40.
- Cook, D. (1998). Psychosocial impact of disability. In R. M. Parker & E. M. Szymanski (Eds.), *Rehabilitation counseling: Basics and beyond* (3rd ed., pp. 303–326.). Austin, TX: Pro-Ed.
- De Vaus, D. (2002). *Surveys in social research*. St. Leonards, Australia: Allen & Unwin.
- Gordon, P. A., Feldman, D., Tantillo, J. C., & Perrone, K. (2004). Attitudes regarding interpersonal relationships with person with mental illness and mental retardation. *Journal of Rehabilitation, 70*(1), 50–56.
- Herbert, J. T. (2000). Director and staff views on including persons with severe disabilities in therapeutic adventure. *Therapeutic Recreation Journal, 34*, 16–32.
- Hergenrather, K., & Rhodes, S. (2007). Exploring undergraduate student attitudes toward persons with disabilities: Application of the Disability Social Relationship Scale. *Rehabilitation Counseling Bulletin, 50*(2), 66–75.
- Hernandez, B., Keys, C. B., & Balcazar, F. E. (2004). Disability rights: Attitudes of private and public sector representatives. *Journal of Rehabilitation, 70*(1), 28–37.
- Johnson, S. D., Aragon, S. R., Shaik, N., & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environments. *Journal of Interactive Learning Research, 11*(1), 29–49.
- Kekkonen-Moneta, S., & Moneta, G. B. (2002). E-learning in Hong Kong: Comparing learning outcomes in online multimedia and lecture versions of an introductory computing course. *British Journal of Educational Technology, 33*(4), 423–433.
- Khawaja, N. G., & Stallman, H. M. (2011). Understanding the coping strategies of international students: A qualitative approach. *Australian Journal of Guidance and Counselling, 21*(2), 203–224.
- Lebowitz, G. (1997). Library services to distant students: An equity issue. *The Journal of Academic Librarianship, 23*(4), 303–308.
- Makas, E. (1991). In the midst: Modified issues in disability scale. In G. Keiger & S. C. Hey (Eds.), *The social organization of disability experiences* (pp. 109–114). Salem, OR: The Society for Disability Studies and Willamette University.
- Martin, H. L., Rowell, M. M., Reid, S. M., Marks, M. K., & Reddihough, D. S. (2005). Cerebral Palsy: What do medical students know and believe? *Journal of Pediatrics and Child Health, 41*(4), 43–47.
- Meyer, L., Gouvier, W. D., Duke, M., & Advokat, C. (2001). Influence of social context on reported attitudes of nondisabled students toward students with disabilities. *Rehabilitation Counseling Bulletin, 45*(1), 50–52.
- Miller, E., Chen, R., Glover-Graf, N. M., & Kranz, P. (2009). Willingness to engage in personal relationships with persons with disabilities. *Rehabilitation Counseling Bulletin, 52*(4), 211–224.
- Newhill, C. E., & Korr, W. S. (2004). Practice with people with severe mental illness: Rewards, challenges, burdens. *Health and Social Work, 29*(4), 297–305.
- Palmer G. A., Redinius, P. L., & Tervo, R. C. (2000). An examination of attitudes toward disabilities among college students: Rural and urban differences. *Journal of Rural Community Psychology, E3*(1), Retrieved from <http://www.marshall.edu/jrcp/Vol31/palmer.html>
- Parashar, D., Chan, F., & Leierer, S. (2004). Factors influencing Asian Indian graduate students' attitudes toward people with disabilities: A conjoint analysis. *Rehabilitation Counseling Bulletin, 51*(4), 229–239.



- Rosenthal, D. A., & Berven, N. L. (1999). Effects of client race on clinical judgment. *Rehabilitation Counseling Bulletin, 42*(2), 243–265.
- Rosenthal, D. A., Chan, F., & Livneh, H. (2006). Rehabilitation students' attitudes toward persons with disabilities in high- and low-stakes social contexts: A conjoint analysis. *Disability and Rehabilitation, 28*(24), 1517–1527.
- Sahin, H., & Akyol, A. D. (2010). Evaluation of nursing and medical students' attitudes towards people with disabilities. *Journal of Clinical Nursing, 19*(15-16), 2271–2279.
- Tervo, R. C., Palmer, G., & Redinius P. (2004). Health professional student attitudes towards people with disability. *Clinical Rehabilitation, 18*(8), 908–915.
- Thomas, A., Palmer, J. K., Coker-Juneau, C. J., & Williams, D. J. (2003). Factor structure and construct validity of the Interaction with Disabled Persons Scale. *Educational and Psychological Measurement, 63*(3), 465–483.
- Vilchinsky, N., & Findler, L. (2004). Attitudes towards Israel's equal rights for people with disabilities law: A multiperspective approach. *Rehabilitation Psychology, 49*(4), 309–316.
- Wang, M -H, Thomas, K. R., Chan, F., & Chieng, G. (2003). A conjoint analysis of factors influencing American and Taiwanese college students' prevalence for people with disabilities. *Rehabilitation Psychology, 48*(3), 195–201.
- World Health Organization & World Bank. (2011). Malta. World report on disability. Retrieved from: [http://whqlibdoc.who.int/publications/2011/9789240685215\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789240685215_eng.pdf)
- Wong, D. W., Chan, F., Cardoso, D. S., Lam, C. S., & Miller, S. M. (2004). Rehabilitation counseling students' attitudes toward people with disabilities in three social contexts: A conjoint analysis. *Rehabilitation Counseling Bulletin, 47*(4), 194–204.
- Yadav, T., Arya, K., Kataria, D., & Balhara, Y. P. S. (2012). Impact of psychiatric education and training on attitude of medical students towards mentally ill: A comparative analysis. *Industrial Psychiatry Journal, 21*(1), 22–31.
- Yuker, H. E., & Block, J. R. (1986). Research with the Attitudes toward Disabled Persons scales. Hempstead, NY: Hofstra University.

# Age-Earning Profiles: Refinement and Applications

David S. Gibson and Erin P. Gibson

Abundant research exists on age-earnings profiles and the positive correlation between experience and earnings. However, much of this research relies on imprecise mathematical models or limited data sources. This paper utilizes rich data offerings of the American Community Survey to generate age-earnings profiles delineated by gender, education, and disability status. In addition to expected trends and relationships, the results show higher levels of growth in the establishment phase of career development for the most educated. Further, we find that males not only earn more than their equally educated female counterparts but also enjoy greater increases in earnings from higher levels of education. Additionally, we show that the decrement in earnings from disability increases with educational level.

A wide range of factors can affect an individual's earnings over the course of his<sup>1</sup> career. Age, gender, education, and disability status can all create significant differences in earnings patterns across individuals. The precise analysis of the combination of these impacts in the form of age-earnings profiles has challenged economists in the past due to the lack of a large and reliable data source. However, in recent years a solution to this problem has presented itself in the form of the data collected by the American Community Survey (ACS) from the U. S. Census Bureau. This paper details methodologies to extract earnings by age, education, gender, and functional disability from the ACS Public Use Microdata Samples (PUMS). It then presents and analyzes the results using data from the 2010–2014 PUMS.

The first section reviews prior research on the construction of age-earnings profiles and the effects of human capital on lifetime earnings. While acknowledging the valuable insight provided by such research, it examines the shortcomings of the past reliance upon mathematical models and suggests a new approach based on the previously unavailable statistical wealth of the ACS.

Next, we discuss our approach for using the ACS to construct age-earnings profiles. This section outlines our specifications for data extraction and defines the sample size for the remainder of the paper.

In the Results section, we analyze the age-earnings profiles generated from cross-sectional data from the ACS. We analyze separately the profiles by education and disability. For education, not only do we confirm earlier research showing higher levels of education associated with higher earnings, but we also show

higher levels of growth in the establishment phase of career development for the most educated. Furthermore, we examine the effects of gender on the impact of education, showing both that males make more than their equally educated female counterparts and that there appears to be a greater inequality in the distribution of income across educational levels in males than in females. For our discussion of disability, we demonstrate the detrimental effect of disability on lifetime earnings. Additionally, we note the relatively larger impact of cognitive limitations compared to mobility limitations and show that the impact of disability increases with educational level.

The final section builds on the previous discussions and explores the application of age-earnings profiles in the forensic setting. We discuss uses for predicting future earnings for a given individual by providing examples for adjusting standard profiles to fit individual criteria (e.g., profession).

## Prior Research

The effects of human capital on a worker's perceived value in the labor market have long been a topic of great interest for economists, and the quantification of this lifetime progression has been documented in age-earning profiles for more than forty years. It is important to note, however, that while such documentations map earnings by biological age, this number is merely a proxy for experience, based on the assumption that individuals at the same age will have acquired similar levels of experience.<sup>2</sup> Mincer (1974) and Heckman (1976) were two of the first economic authorities to quantify this relationship in publications which have remained promi-

nently cited through the test of time. Additional research has explored several questions raised by this quantification, including that by Taubman (1974) which explained the trend of growth in earnings until at least middle age as a result of investment in job training. He further postulated that the delay in peak earnings from education resulted from a continuing “sorting and monitoring” process by employers in which they ascertain an individual’s potential productivity to determine eligibility for promotion.

Since the establishment of the original relationship between earnings and human capital, research has shown that even when education is held constant, profiles can differ drastically across variables such as gender, race, and regional location (Lane & Glennon, 1986). These differences could reflect differences in many areas including work life, job preference, local cost of living, and prejudice.

However, issues have been found in these prominent mathematical models by researchers such as Murphy and Welch (1990) who recognized that Mincer’s human capital function significantly underestimated early growth while overstating mid-career growth, leading to an overall error of about 8% under what can be determined empirically. Despite this error, they recognized a stability of bias in the results suggesting that a “true” specification, aside from the original quadratic one, could be found to correctly alter Mincer’s model. Although they suggested some more accurate forms, they remained unable to determine this “true” model.

## Observations

While much of this prior research certainly reveals valuable trends in age-earnings profiles, it also relies heavily on mathematical models which, as shown by Murphy and Welch, are prone to error. This reliance was originally necessitated by the lack of a large database for the analysis of actual values. However, this need has been alleviated as such a resource exists in the American Community Survey which includes responses from 3.5 million people annually, allowing for the cross-sectional examination of exact age-specific

data for many distinct demographics and, consequently, the creation of more precise age-earnings profiles.

## Our Approach

To develop representative age-earnings profiles, this paper relies on median age-specific values drawn from the combined ACS PUMS files from 2010-2014. We restrict this data to include only earnings for those employed full-time (at least 35 hours/week) and year-round (at least 50 weeks/year), or FTYR in short (Gibson, *Use of ACS to Estimate Lifetime Loss of Earning Capacity as a Result of Disability*, 2015, p. 5). Use of FYTR earnings offers the following advantages:

- FTYR earnings for persons with disabilities are likely for those persons with less severe limitations since they exclude those whose limitations are so severe as to preclude employment or limit them to part-time work. Since the value is to be used as a measure for those with disabilities that maintain a reasonable likelihood of employment, this measure is appropriately suited.
- The earnings for those with and without disabilities are directly comparable by using a common level of employment.

Throughout the analyses, we provide earnings separated by gender,<sup>3</sup> education level, and disability status. For simplicity, we limit education to five representative levels: less than high school, high school graduate, associate degree, baccalaureate degree, and “master’s plus.”<sup>4</sup> For expanded levels, please refer to the appendix.

We analyze disability consistent with the approach presented by Gibson (*Use of ACS to Estimate Lifetime Loss of Earning Capacity as a Result of Disability*, 2015), focusing on the functional limitations shown in Figure 1, which shows the ACS question and the classification we employ.

To narrow our focus, the data analyzed in the narrative of this paper will center on the core limitations of cognitive and mobility. For data on hearing and vision

| Question   | Class.    |
|--|-----------|
| Is this person deaf or does he/she have serious difficulty hearing?  | Hearing   |
| Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?  | Vision    |
| Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions? | Cognitive |
| Does this person have serious difficulty walking or climbing stairs?   | Mobility  |

Figure 1. ACS Disability

please consult the index. Note that the questions do not address specific *injuries*, instead focusing on common *limitations* that may result from a myriad of injuries (Gibson, *Use of ACS to Estimate Lifetime Loss of Earning Capacity as a Result of Disability*, 2015). The limitation-based approach used by the ACS is both consistent with other modern definitions of disability<sup>5</sup> and important for studying the employment impact of a disability. For instance, consider the mobility limitation. Multiple permanent injuries could cause such a limitation, including injuries to a foot, leg, lumbar spine, and many others. However, the important consideration for measuring how limitations affect a person's ability to perform a specific job task (prolonged walking) is how the injury affects functional abilities (mobility).

Thus, the ACS definitions appropriately suit our analyses. While far from exhaustive of every functional limitation, the questions in Figure 1 cover a large percentage of cases encountered in the litigation arena while fitting in the limited space Census is able to allot to the study of disability in the ACS among competing demands.

The data sample analyzed from the combined 5-years of ACS data represents a sample size of almost sixteen million, which we pare to more than four million by focusing on the working age population. For explanations of extraction and adjustment methodology, please refer to Appendix A.

## Discussion of Results

### Profiles by Education

As countless research has shown, a clear relationship exists between education and earnings due to the gains in human capital associated with each increasing educational level. When quantified through age earnings profiles, this relationship can clearly be seen through a comparison of lifetime median earnings. At each subsequent level of education, this value increases universally within each demographic profile regardless of gender or disability status.

As seen in Figure 2, profiles at each educational level share similar characteristics:

- a steep slope in the early years as workers attach to the labor market and gain experience,
- flattening out in the 40s and 50s, and
- an eventual decline as workers approach retirement age.

A closer examination of this growth pattern reveals a difference between educational levels, which accounts for the magnitude of the overall gaps in earnings.

Figure 2, shows that while different educational groups do begin at different earnings levels, this dif-

ference is quite small relative to the peak of each profile. This difference magnifies over time with an increasing slope for each education level; the profiles for baccalaureate and master's degrees demonstrate much steeper slopes in the early years of experience, leading to large overall differences in earnings compared to those with lower levels of education throughout the primary earnings period. Thus, each increase in educational attainment magnifies the impact of age or experience for a person's expected earnings.

It is also important to note that in this discussion we separate our analyses by gender. A comparison of the separate male and female profiles shown in Figure 2 reveals that for every level of education, females consistently earn less than their male counterparts. Discrimination aside,<sup>6</sup> this could be at least partially explained by differences in job preferences and the accumulation of experience. Females tend to have fewer years of employment due to a higher likelihood for absences from the labor force (i.e., taking time off with childbirth); this shorter worklife translates into less experience and consequently lower pay. In relation to this, earnings for males tend to plateau at peak levels earlier than do females, who do not peak until after primary childbearing years (45-50) (Gibson, *Use of ACS to Estimate Lifetime Loss of Earning Capacity as a Result of Disability*, 2015).

Furthermore, differences between the age earnings profiles of males and females can be seen in the trends revealed by Figure 3, which graphs the annual earnings of each education level as a percentage of the lifetime median earnings across all levels of education for a gender. In addition to once again showing a later plateau for females, the data also indicates a greater income inequality across educational levels in males than females. As can be seen, at their peak levels of earnings, the highest educated males make a higher percentage of the lifetime median earnings across males of all levels of education than do the most educated females relative to the lifetime median earnings of females across all levels of education.

As previously noted, this discussion limited education to five representative levels. However, we recognize the differences in Age Earnings profiles for more specific differentiations. For more detailed data, please refer to Appendix B which includes expanded nine educational levels.

### Profiles by Disability

With the development of age earnings profiles, additional factors aside from education can create a divide between groups, with disability status being a prime example. For this analysis we focus only on those with cognitive and mobility limitations, and due to our use of FTYR earnings, the data will be limited to those with nonsevere disabilities. To further simplify the

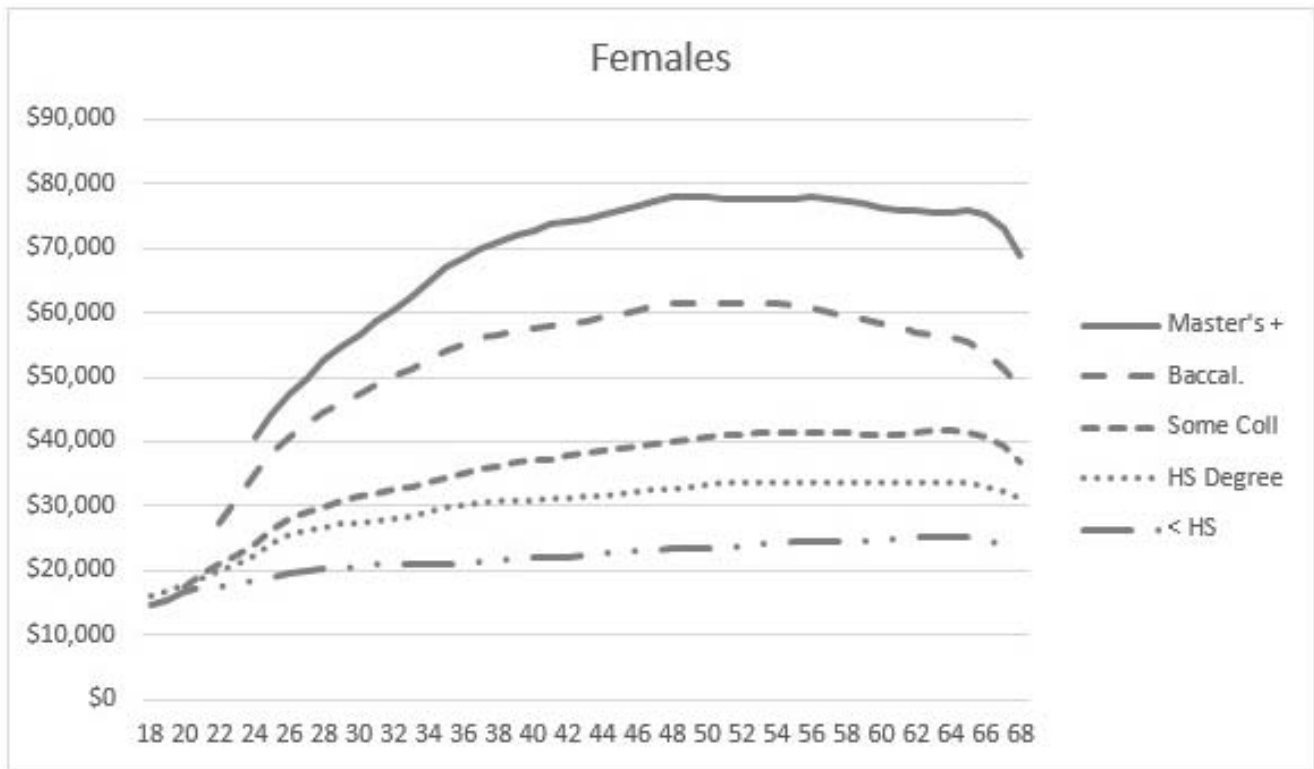
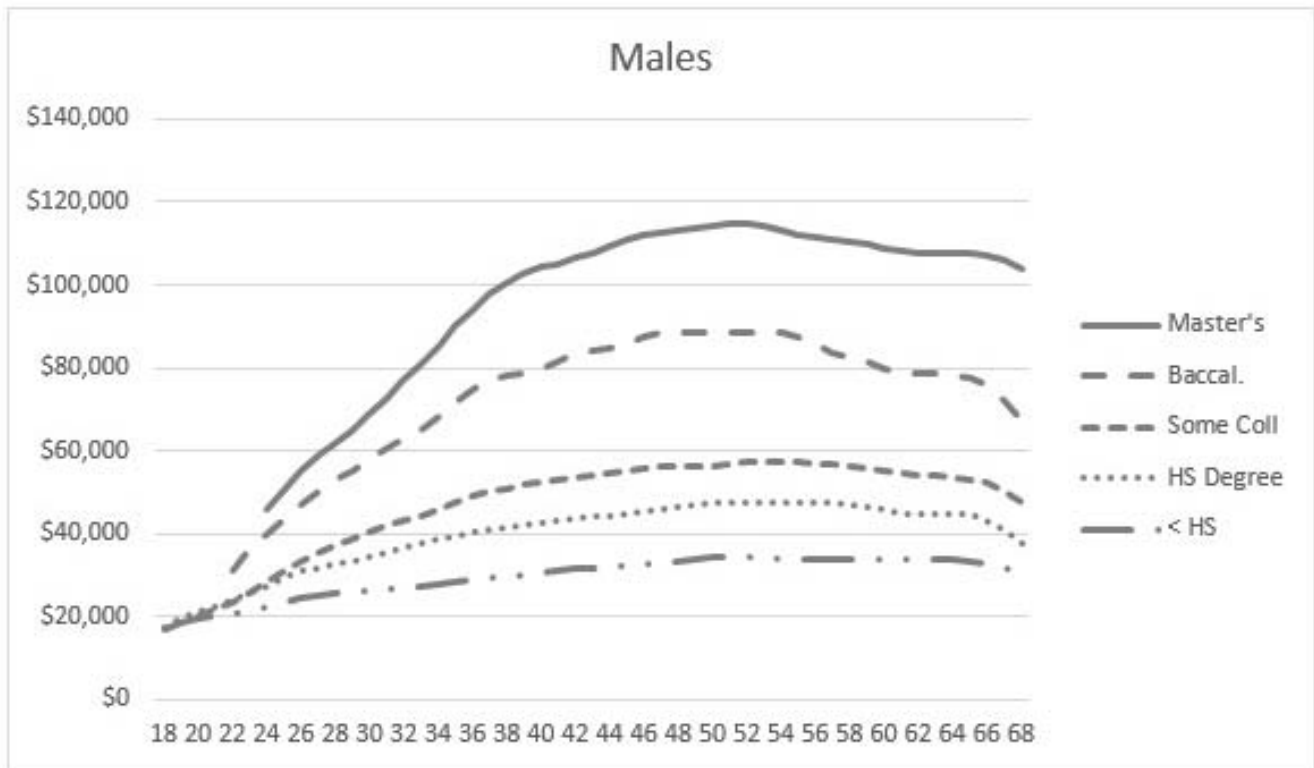


Figure 2. Median Age-Earnings Profiles by Education: No Disability



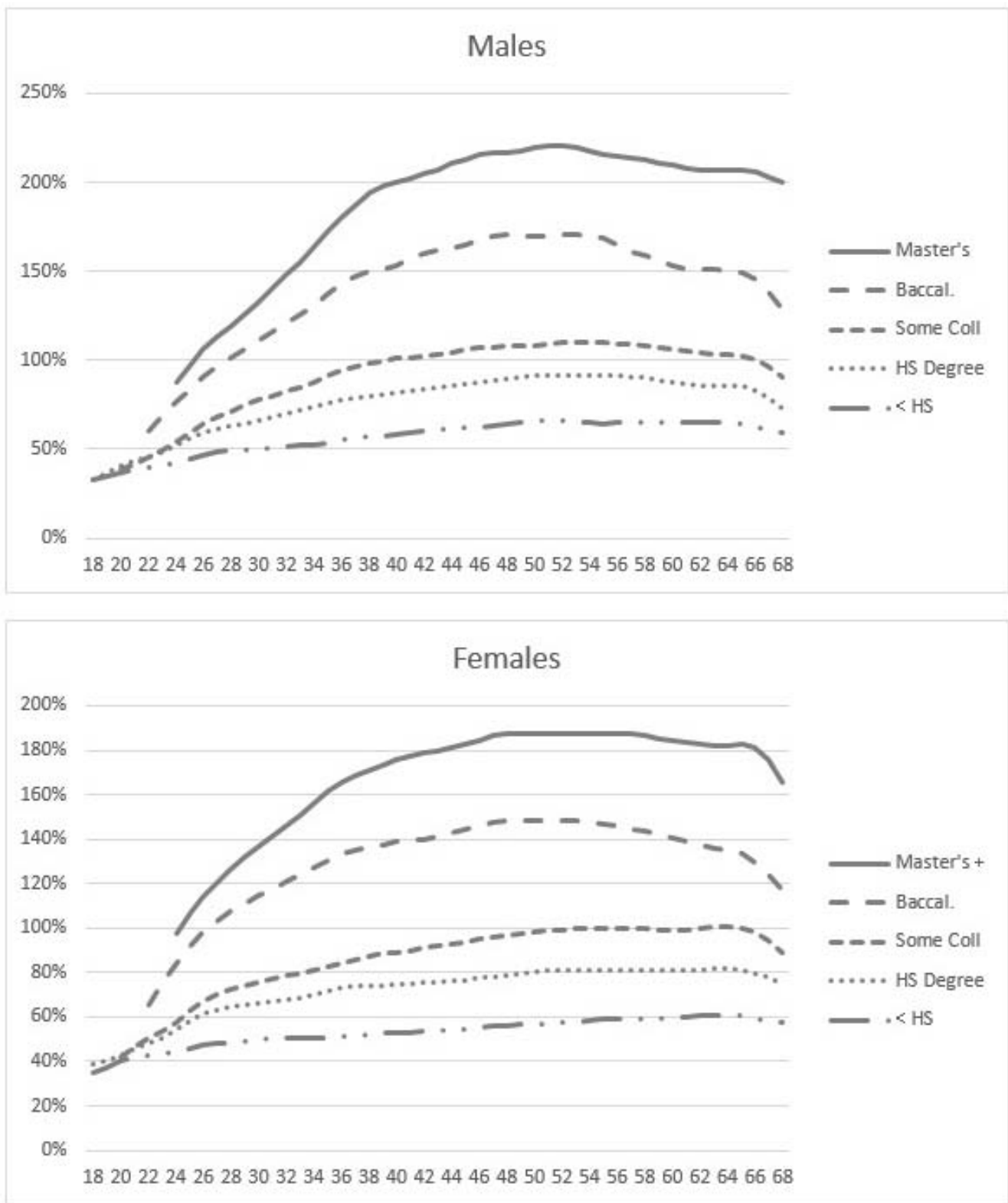


Figure 3. Median Age-Earnings Profiles as Percentage of All Earners

discussion, we focus only on those with a high school diploma.<sup>7</sup>

An overview of Figure 4 reveals that persons with disabilities will, on average, earn less when working than will persons with no disabilities. This is true when controlled for nonsevere disabilities, regardless of gender, education, or form of disability. More specifically, those with cognitive disabilities tend to suffer larger decrements in earnings as compared to those with mobility limitations.

One might ask why there is still a reduction in earnings when controlled for education. Ignoring the potential for discrimination against those with disabilities, the most likely cause for a decrement would stem from the productivity of the worker (Gibson, *Use of ACS to Estimate Lifetime Loss of Earning Capacity as a Result of Disability*, 2015). Despite maintaining capacity for full-time year-round employment, a person with limitations will likely not be so productive as would his same aged, equally educated peers with no limitations. Thus, raises and earnings growth are likely to be lower.

The data reveal an interesting trend across educational level: As the level of education increases, the loss of earnings from disability also increases, with the largest gap occurring at the master’s level. This holds true even for relative loss as Figure 5 graphs the yearly earnings of each profile as a percentage of the

lifetime median for those with no disability, while holding educational level constant. As can be seen, the differences between those with cognitive and mobility limitations and those with no disability increase drastically between those with a high school education and those with a master’s degree and beyond. This increasing decrement is especially striking from the vantage point of mobility limitations since employment at higher levels is largely sedentary.

For this discussion we focused only on the comparison of individuals with no disability to those with mobility or cognitive limitations. However, for wider array of data including hearing and visual limitations, please refer to Appendix B Age-Earnings Profiles.

### Application in Forensic Setting

Age-earnings profiles have many useful applications in the forensic setting. Perhaps the most obvious would be direct application of the values as a prediction of future education-specific earnings for those who have not yet entered the labor market. However, many experts may miss the potential of also using these profiles to derive expected growth for an established wage earner or experience-based projections for a given occupation. The profiles in Appendix B are, in fact, national medians that are not occupation-specific. While there can be a broad range within age

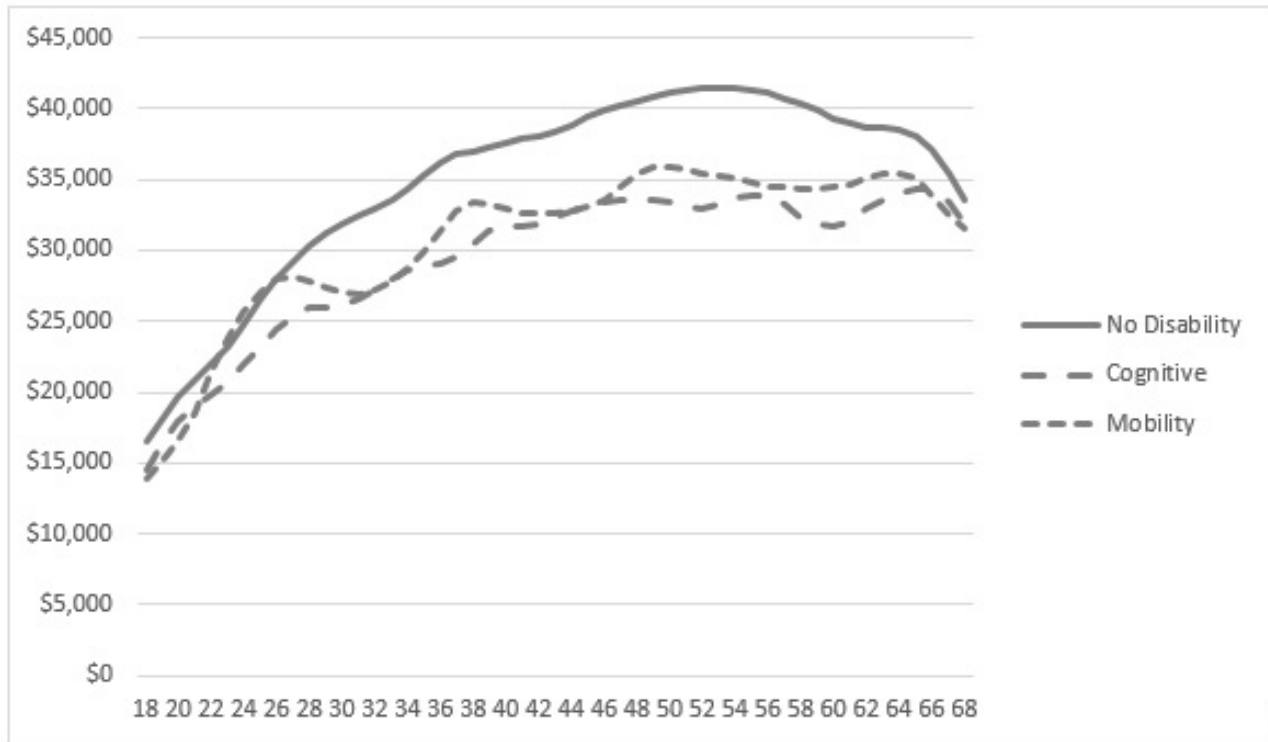


Figure 4. High School Earnings by Disability<sup>12</sup>

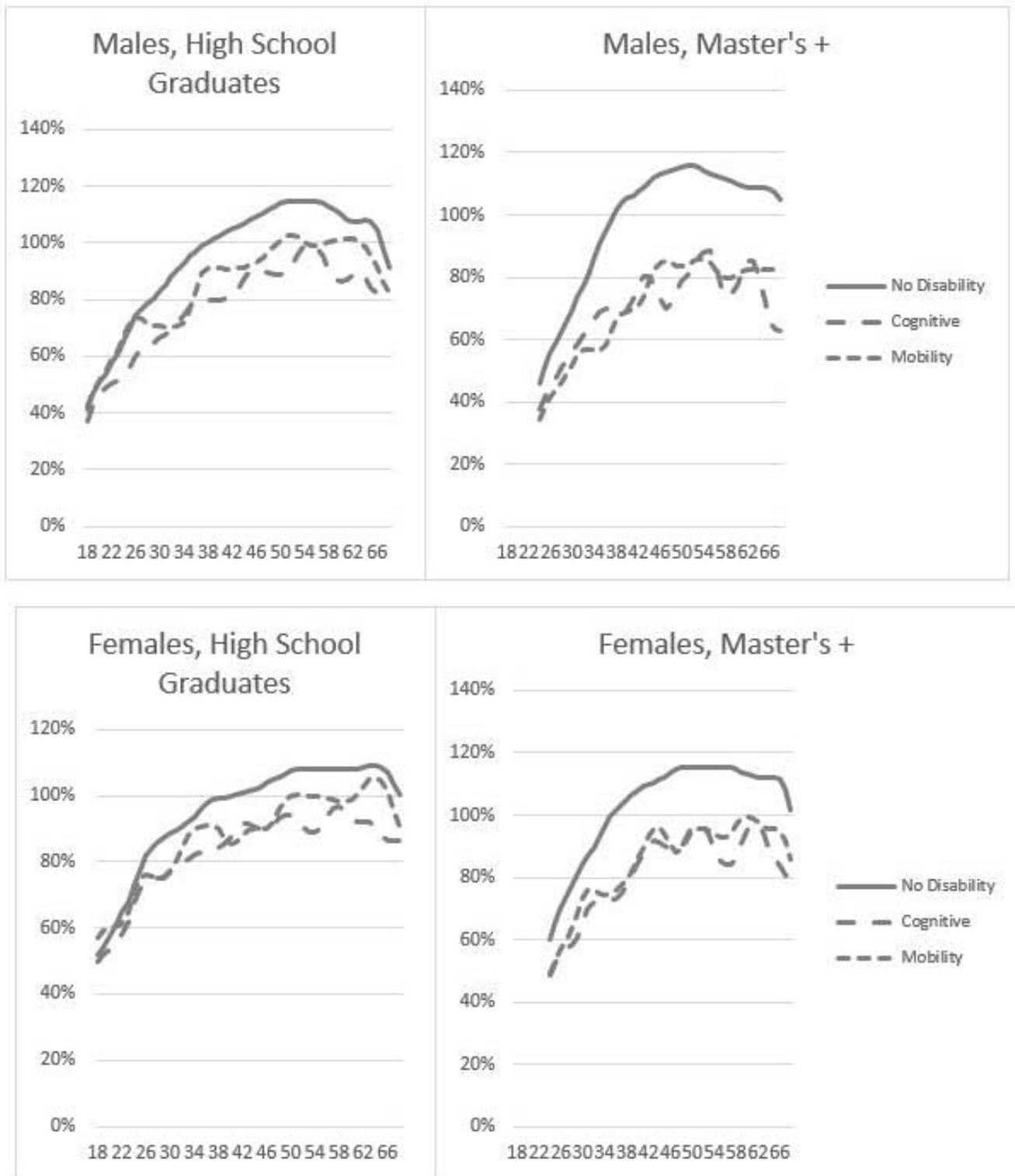


Figure 5. Disability Impact by Gender and Education

earnings profiles even when controlled for educational levels, the following examples demonstrate how they can be adapted to many applications.

### Adapt to Market

For our first example, consider a female currently finishing her baccalaureate degree in Chicago. Based on market data, we know that baccalaureate-educated females working in the Chicago market make approximately 108% of the national median for the same gender and education.<sup>8</sup> In such a scenario, one can simply multiply the age-specific values for females with a baccalaureate degree from Appendix B by 108% for a reasonable projection of her earnings in the Chicago market.

### Project Future Changes

Next, consider a twenty-nine year old female with a baccalaureate degree and assume she currently works as an accountant earning \$50,000 annually; how could an age earnings profile be adapted to estimate her future earnings? Starting with the standard age earn-

ings profile of females with baccalaureate degrees, one could determine the percentage growth in earnings from year to year. While the female in this scenario has higher earnings at age 29 than the median level at that age for all females with a baccalaureate degree (\$46,105), it would still be reasonable to assume that her future expected growth pattern will be similar to her peers. Thus, a more tailored age earnings profile could be constructed starting at age twenty-nine with her actual earnings and grown by the appropriate percentage year to year from that age for the remainder of her expected working life.

Figure 6 presents this application. The first two columns provide the standard-age earnings profile of a female with a baccalaureate degree beginning at the subject's current age. The next column measures the percentage growth in earnings as shown in the standard profile from year to year, and the applied column takes this factor and applies it to the subject's current earnings (\$50,000) to determine her expected annual earnings for the remainder of her working life.

| Age | Profile | % Growth | Applied | Age | Profile | % Growth | Applied |
|-----|---------|----------|---------|-----|---------|----------|---------|
| 29  | 46,105  | 3.6%     | 50,000  | 49  | 61,547  | 0.1%     | 66,698  |
| 30  | 47,438  | 2.9%     | 51,450  | 50  | 61,547  | 0.0%     | 66,698  |
| 31  | 48,680  | 2.6%     | 52,788  | 51  | 61,555  | 0.0%     | 66,698  |
| 32  | 50,055  | 2.8%     | 54,266  | 52  | 61,541  | 0.0%     | 66,698  |
| 33  | 51,422  | 2.7%     | 55,731  | 53  | 61,459  | -0.1%    | 66,631  |
| 34  | 52,697  | 2.5%     | 57,124  | 54  | 61,305  | -0.3%    | 66,431  |
| 35  | 54,027  | 2.5%     | 58,552  | 55  | 61,023  | -0.5%    | 66,099  |
| 36  | 55,229  | 2.2%     | 59,840  | 56  | 60,586  | -0.7%    | 65,636  |
| 37  | 56,008  | 1.4%     | 60,678  | 57  | 60,055  | -0.9%    | 65,045  |
| 38  | 56,561  | 1.0%     | 61,285  | 58  | 59,461  | -1.0%    | 64,395  |
| 39  | 57,125  | 1.0%     | 61,898  | 59  | 58,900  | -0.9%    | 63,815  |
| 40  | 57,578  | 0.8%     | 62,393  | 60  | 58,404  | -0.8%    | 63,304  |
| 41  | 57,848  | 0.5%     | 62,705  | 61  | 57,770  | -1.1%    | 62,608  |
| 42  | 58,131  | 0.5%     | 63,019  | 62  | 57,027  | -1.3%    | 61,794  |
| 43  | 58,594  | 0.8%     | 63,523  | 63  | 56,484  | -1.0%    | 61,176  |
| 44  | 59,184  | 1.0%     | 64,158  | 64  | 56,102  | -0.7%    | 60,748  |
| 45  | 59,809  | 1.1%     | 64,864  | 65  | 55,395  | -1.3%    | 59,958  |
| 46  | 60,477  | 1.1%     | 65,578  | 66  | 53,816  | -2.9%    | 58,219  |
| 47  | 61,102  | 1.0%     | 66,234  | 67  | 51,344  | -4.6%    | 55,541  |
| 48  | 61,461  | 0.6%     | 66,631  | 68  | 48,500  | -5.5%    | 52,486  |

Figure 6. Application of Percent Growth

### Adapt to Occupation

Now consider a twenty-two year old male completing a baccalaureate in economics. From an outside source (e.g., Occupational Employment Statistics), assume we know that all such economists in a given labor market have median earnings of \$85,400, regardless of age. We can construct an age-earnings profile for the subject despite his young age and consequently limited work history. First, consult the standard age earnings profile for males with baccalaureate degrees in Appendix B. In this appendix, note that we also provide the lifetime (regardless of age) median earnings for each category. For this particular category, note that the median is \$73,000. Comparing the lifetime value to the age-specific values, we may evaluate the percentage of lifetime median earnings for males with baccalaureate degrees achieved at each age.

Figure 7 demonstrates application of these percentages year by year to the economist's expected lifetime median earnings to construct his complete age earnings profile. As in the previous example, the age and profile columns reveal the standard age-earnings profile—this time for a male with a baccalaureate degree. The next column measures these annual earnings as a percentage of the median value (\$73,000) for males of the given educational level. The applied column uses this factor to determine the more tailored age-earnings profile for the aspiring economist by applying it to the median earnings for his specific occupation (\$85,400).

### Summary

The wealth of data provided by the ACS provides an unprecedented tool in the construction of age earnings

| Age | Profile | % of<br>\$73,000 | Applied | Age | Profile | % of<br>\$73,000 | Applied |
|-----|---------|------------------|---------|-----|---------|------------------|---------|
| 22  | 31,211  | 42.8%            | 36,551  | 46  | 87,332  | 119.6%           | 102,138 |
| 23  | 35,711  | 48.9%            | 41,761  | 47  | 88,320  | 121.0%           | 103,334 |
| 24  | 39,867  | 54.6%            | 46,628  | 48  | 88,549  | 121.3%           | 103,590 |
| 25  | 43,613  | 59.7%            | 50,984  | 49  | 88,516  | 121.3%           | 103,590 |
| 26  | 46,990  | 64.4%            | 54,998  | 50  | 88,500  | 121.2%           | 103,505 |
| 27  | 50,031  | 68.5%            | 58,499  | 51  | 88,512  | 121.2%           | 103,505 |
| 28  | 52,768  | 72.3%            | 61,744  | 52  | 88,562  | 121.3%           | 103,590 |
| 29  | 55,326  | 75.8%            | 64,733  | 53  | 88,629  | 121.4%           | 103,676 |
| 30  | 57,928  | 79.4%            | 67,808  | 54  | 88,469  | 121.2%           | 103,505 |
| 31  | 60,523  | 82.9%            | 70,797  | 55  | 87,521  | 119.9%           | 102,395 |
| 32  | 62,852  | 86.1%            | 73,529  | 56  | 85,664  | 117.3%           | 100,174 |
| 33  | 65,172  | 89.3%            | 76,262  | 57  | 83,775  | 114.8%           | 98,039  |
| 34  | 68,123  | 93.3%            | 79,678  | 58  | 82,438  | 112.9%           | 96,417  |
| 35  | 71,535  | 98.0%            | 83,692  | 59  | 81,141  | 111.2%           | 94,965  |
| 36  | 74,568  | 102.1%           | 87,193  | 60  | 79,676  | 109.1%           | 93,171  |
| 37  | 76,752  | 105.1%           | 89,755  | 61  | 78,727  | 107.8%           | 92,061  |
| 38  | 77,975  | 106.8%           | 91,207  | 62  | 78,484  | 107.5%           | 91,805  |
| 39  | 78,648  | 107.7%           | 91,976  | 63  | 78,381  | 107.4%           | 91,720  |
| 40  | 79,781  | 109.3%           | 93,342  | 64  | 78,086  | 107.0%           | 91,378  |
| 41  | 81,641  | 111.8%           | 95,477  | 65  | 77,389  | 106.0%           | 90,524  |
| 42  | 83,367  | 114.2%           | 97,527  | 66  | 75,672  | 103.7%           | 88,560  |
| 43  | 84,301  | 115.5%           | 98,637  | 67  | 72,203  | 98.9%            | 84,461  |
| 44  | 84,824  | 116.2%           | 99,235  | 68  | 67,141  | 92.0%            | 78,568  |
| 45  | 85,846  | 117.6%           | 100,430 |     |         |                  |         |

Figure 7. Application of % of Median



profiles through cross sectional analysis. Using our extraction criteria, these profiles can be used to provide valuable insight into the effects of age, gender, education, and disability status on an individual's earnings, and thus provide useful applications in a forensic setting.

Our examination of the effects of education on lifetime earnings reveals many interesting trends. Not only do we echo earlier research showing higher levels of education associated with higher earnings, but we also demonstrate higher levels of growth in the establishment phase of career development. Additionally, gender plays a role on the impact of education. Not only do males make more than their equally educated female counterparts, we note a greater inequality in the distribution of income across educational levels in males than in females.

Next, we explored the impacts of disability, demonstrating the detrimental effect of disability on lifetime earnings. We noted the relatively larger impact of cognitive limitations compared to mobility limitations and showed that the impact of disability increases with educational level.

Finally, we provide applications in a forensic setting of the useful properties of age earnings profiles for predicting earnings of those who have not yet entered the labor market as well as projecting future earnings changes for established workers. Examples were provided for specific cases, showing how the general age earnings profiles for a given educational level could be adjusted to meet individual criteria.

## Appendix A Extraction Methodology

Figure 8 identifies the variables from the 2010 – 2014 PUMS files and the related values used to extract the earnings summarized in this paper.

### Sample Size

The ACS offers an unprecedented statistical wealth in terms of its large sample size. However, due to the specific criteria by which we separate profiles, there remain certain categories with an insufficient sample size. When sample size for an entire category (before segregating by age) is less than 800, we consider it to be insufficient and do not develop an age-earnings profile.<sup>9</sup> We also exclude a profile for females with a mobility limitation and less than a ninth grade education. Although the overall sample size was sufficient (1,606), the data at certain ages was insufficient to the point that even after implementing the centering and imputation measures described below, no meaningful value could be discerned. Figure 10 and Figure 11 show the sample sizes for each of the series generated.

## Statistical Adjustments

After extracting our data through the method described above, we made the following adjustments:

- For disability categories where the sample size by age was less than 40 participants —typically at either early or advanced ages where one might expect labor force participation to be limited— we used forward or backward imputation to estimate median earnings. For example, if we find only 20 observations for 20-year-olds in a given category, we impute the value as a percentage of 21-year-old earnings consistent with the observation for the education level as a whole.
- For disability categories where forward or backward imputation was required for at least 25% of the tabulated ages, we used age-centering to determine median values by using the data of previous and past ages centered around the desired value. For example, rather than relying upon the earnings of only 25-year-olds to determine the median provided, we may use the earnings of all those 24 to 26 years of age. From here if imputation was still required for at least 25%, we increased centering by another year (e.g., for the 25-year-old we use the earnings of all those 23 to 27 years of age) and so on. Figure 12 details which categories rely on this process and how many years they draw upon.
- We smoothed the raw medians using the T4253H algorithm (Velleman, 1980).

## Earnings Adjustment to 2016 Dollars

We restated all earnings from the 2010 – 2014 PUMS in terms of 2016 dollars. To measure wage growth from 2014 to 2016, we use a wage index from the U. S. Bureau of Labor Statistics (*National Employment, Hours, and Earnings: Average Hourly Earnings of Production Workers*, 2016). The average index for 2014 is 20.61. The preliminary index for January 2016<sup>10</sup> is 21.26. Thus, the growth between the two periods is 3.2%. This value is used for the Growth to 2016 column in Figure 13 below.

The growth in earnings from 2010 – 2013 to 2014 is measured as the observed average of all full-time, year-round workers in the respective 2010 – 2013 PUMS data to the same value in the 2014 data. These values are shown in Figure 13 below as “Growth to 2014.” When compounded<sup>11</sup> by the 3.2% adjustment factor discussed above, we derive the adjustment shown in “Growth to 2016.” This adjustment is applied to the PUMS earning data in each year when pooling the years into a single sample.

| Variable      | Description                                   | Use   |
|---------------|---|---|
| <b>AGEP</b>   | Age   | All ages 18-89 by age, with starting age delayed depending upon education; ages 68-89 are grouped and reported as 68. |
| <b>SCHL</b>   | Educational attainment                        | See Figure 9 below  |
| <b>ESR</b>    | Employment status                             | Civilians: use 1, 2, 3, or 6  |
| <b>SEX</b>    | Gender  | 1 for males, 2 for females  |
| <b>PWGTP</b>  | Weight  | Use weight to determine median  |
| <b>DPHY</b>   | Mobility disability (1 for yes, 2 for no)     | 1 when measuring mobility, 2 for no disability, 1 or 2 otherwise  |
| <b>DREM</b>   | Cognitive disability (1 for yes, 2 for no)    | 1 when measuring cognitive, 2 for no disability, 1 or 2 otherwise   |
| <b>DEYE</b>   | Vision disability (1 for yes, 2 for no)       | 1 when measuring vision, 2 for no disability, 1 or 2 otherwise  |
| <b>DEAR</b>   | Hearing disability (1 for yes, 2 for no)      | 1 when measuring hearing, 2 for no disability, 1 or 2 otherwise   |
| <b>WKHP</b>   | Usual hours worked per week in past 12 months | >= 35 for full-time   |
| <b>WKW</b>    | Weeks worked in past 12 months                | >= 50 for year-round  |
| <b>ADJINC</b> | Seasonal adjustment factor                    | Multiplied by PERNP   |
| <b>PERNP</b>  | Total earnings (wage & self-employment)       | Use as earnings value, multiplied by ADJINC and adjusted to current year as discussed on page 17.                     |

Figure 8. Earnings Extraction Criteria

| SCHL Values | Education Level   |
|-------------|---|
| 0 – 11      | Less than 9 <sup>th</sup> grade   |
| 12-15       | Some high school  |
| 16          | High school graduate  |
| 17          | GED or alternative  |
| 18-19       | Some college, no degree   |
| 20          | Associate degree  |
| 21          | Baccalaureate degree  |
| 22-24       | Master's + (Master's, Professional, or Doctorate degrees) <sup>14</sup> |
| 0 – 24      | All levels of education   |

Figure 9. Education Level Classification<sup>13</sup>

| Education               | Not Disabled | Cognitive | Mobility | Vision | Hearing |
|-------------------------|--------------|-----------|----------|--------|---------|
| Less Than 9th grade     | 82,000       | 1,552     | 2,131    | 1,814  | 2,497   |
| Some High School        | 130,182      | 2,451     | 3,426    | 2,408  | 4,279   |
| GED or Alt. Credential  | 82,832       | 1,552     | 2,169    | 1,216  | 2,997   |
| High School Graduate    | 576,678      | 6,828     | 10,692   | 6,428  | 17,559  |
| Some College, No Degree | 530,081      | 6,189     | 10,084   | 5,591  | 15,763  |
| Associate Degree        | 208,194      | 1,818     | 3,244    | 1,883  | 5,462   |
| Baccalaureate Degree    | 564,048      | 3,181     | 5,327    | 3,396  | 9,098   |
| Master's Plus           | 346,322      | 1,524     | 3,361    | 2,096  | 6,148   |

Figure 10. Male Sample Size

| Education               | Not Disabled | Cognitive | Mobility | Vision | Hearing |
|-------------------------|--------------|-----------|----------|--------|---------|
| Less Than 9th grade     | 35,689       | 921       | 1,606    | 993    | 685     |
| Some High School        | 62,874       | 1,506     | 2,972    | 1,465  | 1,253   |
| GED or Alt. Credential  | 50,606       | 1,076     | 2,202    | 922    | 956     |
| High School Graduate    | 381,317      | 4,489     | 11,423   | 4,630  | 5,574   |
| Some College, No Degree | 441,150      | 5,471     | 12,641   | 5,371  | 6,157   |
| Associate Degree        | 217,707      | 2,014     | 4,769    | 2,083  | 2,586   |
| Baccalaureate Degree    | 474,952      | 2,670     | 6,082    | 3,026  | 3,938   |
| Master's Plus           | 298,671      | 1,328     | 3,782    | 1,800  | 2,739   |

Figure 11. Female Sample Size

|                  | Males    |           |        |         | Females  |           |        |         |
|------------------|----------|-----------|--------|---------|----------|-----------|--------|---------|
|                  | Mobility | Cognitive | Vision | Hearing | Mobility | Cognitive | Vision | Hearing |
| < 9th Grade      | 2        | 1         | 2      | 2       |          | 3         | 4      |         |
| Some HS          | 1        | 1         | 1      | 1       | 2        | 1         | 2      | 2       |
| GED / Alt. Cred. | 1        | 1         | 2      | 1       | 3        | 1         | 2      | 3       |
| HS Graduate      |          |           |        |         |          |           |        |         |
| Some College     |          |           |        |         |          |           |        |         |
| Associate        | 1        | 1         | 1      |         | 1        |           |        | 1       |
| Baccalaureate    |          |           |        |         | 1        | 1         | 1      | 1       |
| Master's Plus    | 1        | 1         | 1      | 1       | 1        | 1         | 1      | 1       |

Figure 12. Age-Centered Categories<sup>15</sup>

| Year | Avg. Earn | Growth to 2014 | Growth to 2016 |
|------|-----------|----------------|----------------|
| 2010 | \$57,006  | 8.1%           | 11.5%          |
| 2011 | \$58,565  | 5.2%           | 8.5%           |
| 2012 | \$59,239  | 4.0%           | 7.3%           |
| 2013 | \$60,719  | 1.5%           | 4.7%           |
| 2014 | \$61,617  | -              | 3.2%           |

Figure 13. Earnings Growth Adjustment Rates

## Appendix B Age-Earnings Profiles

The tables in this appendix provide the age-earnings profiles for each group described in this paper. Each figure represents one educational level in ascending order, and from there, profiles are separated by gender and disability status using the extraction and adjustment methodology described in Appendix A Extraction Methodology. Each figure listed below contains the all-age earnings and age-specific earnings by gender and disability status.

- Figure 14. Age-Earnings Profile Less Than 9th Grade
- Figure 15. Age-Earnings Profile Some High School
- Figure 16. Age-Earnings Profile GED or Alternate Credential
- Figure 17. Age-Earnings Profile High School Graduate
- Figure 18. Age-Earnings Profile Some College, No Degree
- Figure 19. Age-Earnings Profile Associate Degree
- Figure 20. Age-Earnings Profile Baccalaureate Degree
- Figure 21. Age-Earnings Profile Master's Degree Plus

## References

- Gibson, D. S. (2015). *Use of ACS to estimate lifetime loss of earning capacity as a result of disability*. Paper presented to the American Community Survey Data Users Conference and the United States Census Bureau. College Park. doi:10.13140/RG.2.1.3212.6887
- Gibson, D. S. (2015). *Use of ACS to improve occupational earnings estimates*. Working paper presented to the 2015 IARP Annual Conference. New Orleans. doi:10.13140/RG.2.1.3863.3680
- Heckman, J. J. (1976, August). A life-cycle model of earnings, learning, and consumption. *Journal of Political Economy*, 84(4), S11–S44.
- Lane, J., & Glennon, D. (1986). The estimation of age/earnings profiles in wrongful death and injury cases. *The Journal of Risk and Insurance*, 52(4), 686–695.
- Mincer, J. (1974). *Schooling, experience, and earnings. human behavior & social institutions*. New York, NY: National Bureau of Economic Research.
- Murphy, K., & Welch, F. (1990). Empirical Age-Earnings Profiles. *Journal of Labor Economics*, 202–229.
- Taubman, T. (1974). Age-Earnings profiles. In T. Taubman (Ed.), *Higher Education and Earnings: College as an Investment and Screening Device* (pp. 113–122). NBER.
- U. S. Bureau of Labor Statistics. (2016). *National Employment, hours, and earnings: Average hourly earnings of production workers*. Retrieved March 2016, from <http://data.bls.gov/cgi-bin/srgate> (Use Series ID #: CEU0500000008)
- Velleman, P. F. (1980, September). Definition and comparison of robust nonlinear data smoothing algorithms. *Journal of the American Statistical Association*, 75(372), 609–615.

## Endnotes

<sup>1</sup> Rather than deal with awkward he/she and his/her references throughout this paper, we adopt masculine pronouns for convenience only.

<sup>2</sup> Our analyses make a similar assumption.

<sup>3</sup> For a profile for both genders combined, please contact the authors.

<sup>4</sup> The master's plus category includes all those with the equivalent of at least a master's degree.

<sup>5</sup> The Americans with Disabilities Act (ADA) also relies upon functional limitations, defining a disability as a physical or mental impairment that substantially limits one or more major life activities.

<sup>6</sup> See Gibson (Gibson, *Use of ACS to Improve Occupational Earnings Estimates*, 2015) for a fuller discussion of gender differences controlled for age, education, and occupation.

<sup>7</sup> While the following trend holds true for the majority of the data, an exception can be seen in the data which present earnings of males with less than a high school

education. In this scenario, the earnings for those with a mobility limitation remain very close—and at times even surpass—the profile for those with no disability. However, this can likely be explained by differences in the distribution of jobs sought and maintained by those with disabilities (Gibson, *Use of ACS to Estimate Lifetime Loss of Earning Capacity as a Result of Disability*, 2015). In this case, a person with a mobility limitation is more likely to pursue sedentary employment than his able-bodied peers—a career path which typically leads to higher pay than more physically demanding employment.

<sup>8</sup> There are multiple surveys that provide market-specific earnings from which to derive such an adjustment. See for example Gibson (*Use of ACS to Improve Occupational Earnings Estimates*, 2015).

<sup>9</sup> This is the case for females with a hearing limitation and less than a ninth grade education.

<sup>10</sup> This is the most current release at the time of this article.

<sup>11</sup> The compound growth is computed as  $1.032 \times (1 + G14)$ , where G14 is the respective value from the Growth to 2014 column.

<sup>12</sup> Note that the disability profiles exhibit an irregular, “wavy” progression. This is more likely due to the smaller sample sizes available to measure disability-specific earnings than to the actual profile. As noted in , the profiles have been adjusted for statistical smoothing to the degree possible.

<sup>13</sup> The education levels encompass all the SCHL values tracked by the ACS.

<sup>14</sup> Sample sizes limit the ability to generate profiles for each of these detailed education levels for some disability types. Further information is available from the authors.

<sup>15</sup> The numbering refers to the number of years on each side of the desired age required to attain the value. For example where the chart denotes 1, a total of three years was used to determine the earnings at each age—the year itself, the year before, and the year after. Blank spaces in the table denote that no centering was required.



| Age      | Males   |        |        |        |        | Females |        |        |        |        |
|----------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear   | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 27,000  | 27,000 | 29,000 | 26,500 | 29,000 | 21,000  | 21,500 | 21,000 | 21,000 | 21,000 |
| 18       | 17,000  | 15,776 | 23,407 | 15,349 | 18,036 | 16,000  | 19,436 | -      | 18,987 | -      |
| 19       | 18,277  | 16,918 | 25,102 | 16,461 | 19,343 | 16,445  | 19,842 | -      | 19,384 | -      |
| 20       | 19,273  | 17,826 | 26,449 | 17,345 | 20,381 | 16,742  | 20,220 | -      | 19,750 | -      |
| 21       | 19,934  | 18,436 | 27,355 | 17,938 | 21,078 | 16,906  | 20,596 | -      | 20,108 | -      |
| 22       | 20,375  | 18,842 | 27,976 | 18,341 | 21,551 | 17,176  | 21,008 | -      | 20,519 | -      |
| 23       | 20,791  | 19,192 | 28,533 | 18,695 | 21,967 | 17,699  | 21,354 | -      | 21,006 | -      |
| 24       | 21,217  | 19,701 | 29,126 | 19,076 | 22,414 | 18,250  | 21,499 | -      | 21,526 | -      |
| 25       | 21,611  | 20,927 | 29,785 | 19,461 | 22,879 | 18,672  | 21,517 | -      | 21,998 | -      |
| 26       | 22,137  | 22,773 | 30,455 | 19,857 | 23,289 | 18,953  | 21,454 | -      | 22,342 | -      |
| 27       | 22,758  | 24,002 | 30,905 | 20,506 | 23,741 | 19,078  | 21,037 | -      | 22,524 | -      |
| 28       | 23,150  | 24,191 | 31,035 | 21,626 | 24,562 | 19,162  | 19,898 | -      | 22,584 | -      |
| 29       | 23,344  | 23,768 | 30,722 | 22,906 | 25,731 | 19,236  | 18,424 | -      | 22,623 | -      |
| 30       | 23,670  | 23,199 | 29,386 | 23,805 | 26,629 | 19,277  | 17,539 | -      | 22,681 | -      |
| 31       | 24,121  | 22,961 | 27,340 | 24,164 | 26,906 | 19,316  | 17,344 | -      | 22,711 | -      |
| 32       | 24,451  | 23,676 | 26,002 | 24,186 | 26,609 | 19,367  | 17,703 | -      | 22,611 | -      |
| 33       | 24,688  | 25,137 | 25,678 | 24,109 | 25,670 | 19,551  | 18,916 | -      | 22,299 | -      |
| 34       | 25,066  | 25,914 | 25,658 | 24,080 | 24,682 | 19,855  | 20,549 | -      | 21,941 | -      |
| 35       | 25,598  | 25,859 | 25,783 | 24,086 | 24,336 | 20,070  | 21,707 | -      | 21,740 | -      |
| 36       | 26,094  | 25,688 | 26,365 | 24,295 | 24,660 | 20,182  | 22,180 | -      | 21,658 | -      |
| 37       | 26,512  | 25,602 | 27,629 | 24,994 | 25,498 | 20,248  | 22,260 | -      | 21,508 | -      |
| 38       | 26,840  | 26,168 | 29,592 | 25,891 | 26,336 | 20,297  | 22,150 | -      | 20,953 | -      |
| 39       | 27,064  | 28,098 | 31,566 | 26,422 | 27,006 | 20,389  | 21,820 | -      | 20,188 | -      |
| 40       | 27,332  | 30,258 | 32,580 | 26,568 | 27,945 | 20,479  | 21,371 | -      | 19,820 | -      |
| 41       | 27,705  | 31,055 | 32,766 | 26,668 | 29,293 | 20,508  | 21,020 | -      | 19,873 | -      |
| 42       | 28,107  | 30,713 | 32,236 | 26,834 | 30,512 | 20,539  | 20,807 | -      | 20,041 | -      |
| 43       | 28,510  | 29,682 | 30,943 | 27,016 | 31,070 | 20,633  | 20,729 | -      | 20,125 | -      |
| 44       | 28,898  | 28,645 | 29,850 | 27,377 | 31,154 | 20,758  | 20,758 | -      | 20,125 | -      |
| 45       | 29,273  | 28,297 | 29,299 | 28,070 | 30,885 | 20,916  | 20,855 | -      | 20,123 | -      |
| 46       | 29,652  | 28,297 | 28,762 | 28,717 | 30,102 | 21,170  | 21,105 | -      | 20,117 | -      |
| 47       | 30,043  | 28,297 | 28,207 | 28,938 | 29,305 | 21,514  | 21,621 | -      | 20,143 | -      |
| 48       | 30,438  | 28,098 | 27,922 | 28,729 | 29,031 | 21,791  | 22,168 | -      | 20,234 | -      |
| 49       | 30,797  | 27,492 | 27,906 | 28,174 | 29,330 | 21,883  | 22,414 | -      | 20,359 | -      |
| 50       | 31,031  | 26,879 | 28,328 | 27,660 | 30,021 | 21,910  | 22,445 | -      | 20,484 | -      |
| 51       | 31,080  | 26,672 | 29,447 | 27,461 | 30,508 | 21,965  | 22,398 | -      | 20,641 | -      |
| 52       | 31,037  | 26,801 | 30,545 | 27,447 | 30,623 | 21,992  | 22,271 | -      | 20,830 | -      |
| 53       | 30,977  | 27,152 | 30,914 | 27,496 | 30,666 | 21,992  | 22,127 | -      | 20,959 | -      |
| 54       | 30,836  | 27,469 | 30,846 | 27,541 | 30,719 | 22,029  | 22,031 | -      | 20,996 | -      |
| 55       | 30,672  | 27,555 | 30,371 | 27,523 | 30,891 | 22,166  | 22,000 | -      | 21,004 | -      |
| 56       | 30,609  | 27,539 | 29,477 | 27,396 | 31,141 | 22,328  | 22,000 | -      | 21,057 | -      |
| 57       | 30,609  | 27,500 | 28,838 | 27,174 | 31,250 | 22,371  | 22,000 | -      | 21,154 | -      |
| 58       | 30,680  | 27,396 | 28,688 | 26,922 | 31,199 | 22,395  | 22,004 | -      | 21,203 | -      |
| 59       | 30,820  | 27,283 | 28,801 | 26,633 | 30,973 | 22,531  | 21,949 | -      | 21,141 | -      |
| 60       | 30,902  | 26,980 | 29,113 | 26,242 | 30,672 | 22,699  | 21,668 | -      | 21,016 | -      |
| 61       | 30,965  | 26,217 | 29,434 | 25,607 | 30,547 | 22,869  | 21,156 | -      | 20,953 | -      |
| 62       | 30,930  | 25,469 | 29,709 | 24,885 | 30,832 | 23,018  | 20,598 | -      | 21,023 | -      |
| 63       | 30,625  | 25,217 | 30,043 | 24,539 | 31,527 | 23,070  | 19,988 | -      | 21,225 | -      |
| 64       | 30,188  | 25,242 | 30,283 | 24,580 | 32,063 | 22,994  | 19,346 | -      | 21,416 | -      |
| 65       | 29,664  | 25,436 | 30,344 | 24,775 | 32,188 | 22,775  | 18,939 | -      | 21,477 | -      |
| 66       | 29,055  | 25,828 | 30,238 | 24,949 | 31,840 | 22,566  | 18,836 | -      | 21,389 | -      |
| 67       | 28,625  | 26,357 | 29,816 | 25,000 | 30,449 | 22,500  | 18,836 | -      | 21,182 | -      |
| 68       | 28,500  | 27,055 | 29,078 | 25,000 | 28,016 | 22,500  | 18,836 | -      | 21,000 | -      |

Figure 14. Age-Earnings Profile Less Than 9<sup>th</sup> Grade

| Age      | Males   |        |        |        |        | Females |        |        |        |        |
|----------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear   | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 31,000  | 28,000 | 33,000 | 31,000 | 35,000 | 24,000  | 22,000 | 23,000 | 22,000 | 23,000 |
| 18       | 17,000  | 16,526 | 17,236 | 14,827 | 15,341 | 14,000  | 13,498 | 11,886 | 15,436 | 13,802 |
| 19       | 18,281  | 17,644 | 18,784 | 15,985 | 16,741 | 15,250  | 15,211 | 13,176 | 17,365 | 15,300 |
| 20       | 19,500  | 18,874 | 20,126 | 16,883 | 17,955 | 16,525  | 17,490 | 14,258 | 18,793 | 16,557 |
| 21       | 20,406  | 20,375 | 21,154 | 17,599 | 19,014 | 17,295  | 19,597 | 14,957 | 19,264 | 17,365 |
| 22       | 20,994  | 21,688 | 21,889 | 18,412 | 20,076 | 17,486  | 20,369 | 15,287 | 19,089 | 17,738 |
| 23       | 21,576  | 22,266 | 22,509 | 19,538 | 21,030 | 17,631  | 20,048 | 15,514 | 18,478 | 17,990 |
| 24       | 22,539  | 22,238 | 23,486 | 20,834 | 21,613 | 18,109  | 19,043 | 15,863 | 17,780 | 18,444 |
| 25       | 23,947  | 22,063 | 25,012 | 21,955 | 21,803 | 18,902  | 17,725 | 16,431 | 17,519 | 19,103 |
| 26       | 25,266  | 22,043 | 26,419 | 22,846 | 22,070 | 19,729  | 16,781 | 17,415 | 17,919 | 19,848 |
| 27       | 26,053  | 22,281 | 27,124 | 23,553 | 22,977 | 20,299  | 16,436 | 18,663 | 19,018 | 20,816 |
| 28       | 26,523  | 22,846 | 27,508 | 24,330 | 24,070 | 20,602  | 16,398 | 19,570 | 20,176 | 21,765 |
| 29       | 26,994  | 24,014 | 28,164 | 25,521 | 24,584 | 20,891  | 17,199 | 19,922 | 20,914 | 22,133 |
| 30       | 27,471  | 25,666 | 28,852 | 26,578 | 24,756 | 21,273  | 19,652 | 19,977 | 21,350 | 21,479 |
| 31       | 27,861  | 26,943 | 29,074 | 26,799 | 24,934 | 21,592  | 22,188 | 19,949 | 21,531 | 20,105 |
| 32       | 28,256  | 27,453 | 29,051 | 26,465 | 25,547 | 21,736  | 23,102 | 19,912 | 21,553 | 19,322 |
| 33       | 28,961  | 27,510 | 29,242 | 26,166 | 27,246 | 21,793  | 22,963 | 19,889 | 21,428 | 19,258 |
| 34       | 30,037  | 27,391 | 29,990 | 26,203 | 29,457 | 21,867  | 22,561 | 20,070 | 20,953 | 20,066 |
| 35       | 31,014  | 27,113 | 31,209 | 26,826 | 31,031 | 21,934  | 22,234 | 20,686 | 20,357 | 22,322 |
| 36       | 31,578  | 26,768 | 32,453 | 27,949 | 31,730 | 21,982  | 21,992 | 21,459 | 20,117 | 24,408 |
| 37       | 31,967  | 26,617 | 33,684 | 28,957 | 32,066 | 22,072  | 21,727 | 21,910 | 20,150 | 25,047 |
| 38       | 32,336  | 26,846 | 34,641 | 29,643 | 32,516 | 22,227  | 21,408 | 22,047 | 20,328 | 24,898 |
| 39       | 32,627  | 27,303 | 34,898 | 30,367 | 33,078 | 22,523  | 20,865 | 22,172 | 20,615 | 24,496 |
| 40       | 32,906  | 27,531 | 34,361 | 31,102 | 33,609 | 22,961  | 20,383 | 22,357 | 20,820 | 23,910 |
| 41       | 33,281  | 27,516 | 33,316 | 31,451 | 33,953 | 23,320  | 20,242 | 22,479 | 21,002 | 23,045 |
| 42       | 33,719  | 27,305 | 32,619 | 31,494 | 34,035 | 23,471  | 20,648 | 22,506 | 21,326 | 22,020 |
| 43       | 34,156  | 26,930 | 32,375 | 31,563 | 34,004 | 23,553  | 21,834 | 22,500 | 21,770 | 21,303 |
| 44       | 34,592  | 26,750 | 31,924 | 31,740 | 33,969 | 23,797  | 23,018 | 22,494 | 22,191 | 21,039 |
| 45       | 34,922  | 26,842 | 31,350 | 31,939 | 33,957 | 24,174  | 23,453 | 22,523 | 22,438 | 21,000 |
| 46       | 35,182  | 27,139 | 31,117 | 32,023 | 34,004 | 24,463  | 23,396 | 22,652 | 22,500 | 21,000 |
| 47       | 35,578  | 27,520 | 31,154 | 32,055 | 34,172 | 24,664  | 23,219 | 22,848 | 22,500 | 21,031 |
| 48       | 36,047  | 27,814 | 31,514 | 32,117 | 34,676 | 24,912  | 23,127 | 22,977 | 22,510 | 21,221 |
| 49       | 36,590  | 27,990 | 32,184 | 32,242 | 35,648 | 25,170  | 23,125 | 23,008 | 22,529 | 21,730 |
| 50       | 37,271  | 28,250 | 32,594 | 32,578 | 36,676 | 25,375  | 23,125 | 23,006 | 22,508 | 22,432 |
| 51       | 37,756  | 29,088 | 32,619 | 32,988 | 37,359 | 25,588  | 23,125 | 23,002 | 22,357 | 22,945 |
| 52       | 37,881  | 30,404 | 32,266 | 33,176 | 37,797 | 25,746  | 22,877 | 23,000 | 22,146 | 23,180 |
| 53       | 37,818  | 31,367 | 31,670 | 33,182 | 38,047 | 25,799  | 22,350 | 23,045 | 22,051 | 23,313 |
| 54       | 37,699  | 31,594 | 31,391 | 33,092 | 38,172 | 25,875  | 22,039 | 23,260 | 22,078 | 23,492 |
| 55       | 37,604  | 31,453 | 31,836 | 32,656 | 38,385 | 26,000  | 22,020 | 23,711 | 22,301 | 23,820 |
| 56       | 37,496  | 31,461 | 33,008 | 32,000 | 38,623 | 26,125  | 22,186 | 24,205 | 22,813 | 24,217 |
| 57       | 37,385  | 32,057 | 34,078 | 31,703 | 38,711 | 26,219  | 22,482 | 24,475 | 23,412 | 24,457 |
| 58       | 37,336  | 32,967 | 34,465 | 31,957 | 38,529 | 26,250  | 22,625 | 24,527 | 23,873 | 24,568 |
| 59       | 37,336  | 33,375 | 34,613 | 32,629 | 38,135 | 26,250  | 22,656 | 24,516 | 24,148 | 24,850 |
| 60       | 37,383  | 32,875 | 35,125 | 33,332 | 37,891 | 26,328  | 22,906 | 24,490 | 24,229 | 25,367 |
| 61       | 37,557  | 31,813 | 36,387 | 33,797 | 37,861 | 26,604  | 23,593 | 24,455 | 24,119 | 25,926 |
| 62       | 37,844  | 31,188 | 38,410 | 34,100 | 38,053 | 26,922  | 24,580 | 24,465 | 24,098 | 26,473 |
| 63       | 38,045  | 31,240 | 40,172 | 34,295 | 38,430 | 27,045  | 25,431 | 24,648 | 24,578 | 26,900 |
| 64       | 37,969  | 31,600 | 40,766 | 34,031 | 38,523 | 27,016  | 25,851 | 25,201 | 25,582 | 27,047 |
| 65       | 37,418  | 31,973 | 39,672 | 32,664 | 37,648 | 26,723  | 25,942 | 25,869 | 26,559 | 26,961 |
| 66       | 36,230  | 31,758 | 36,492 | 30,510 | 35,486 | 25,980  | 25,587 | 26,141 | 27,156 | 26,742 |
| 67       | 34,496  | 30,383 | 32,309 | 28,572 | 32,857 | 25,250  | 24,169 | 26,141 | 27,531 | 26,469 |
| 68       | 32,500  | 27,977 | 28,000 | 27,000 | 30,500 | 25,000  | 21,688 | 26,141 | 27,688 | 26,141 |

Figure 15. Age-Earnings Profile Some High School

| Age      | Males   |        |        |        |        | Females |        |        |        |        |
|----------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear   | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 39,500  | 34,500 | 39,000 | 35,500 | 41,000 | 29,000  | 26,000 | 28,500 | 26,000 | 27,500 |
| 18       | 18,023  | 18,260 | 21,518 | 20,170 | 20,536 | 16,359  | 15,110 | 18,863 | 12,683 | 13,063 |
| 19       | 19,555  | 19,352 | 22,782 | 21,434 | 21,743 | 16,703  | 15,647 | 19,533 | 13,134 | 13,508 |
| 20       | 20,867  | 20,411 | 24,046 | 22,611 | 22,949 | 17,766  | 16,429 | 20,510 | 13,791 | 14,168 |
| 21       | 21,973  | 21,288 | 25,325 | 23,475 | 24,173 | 19,113  | 17,409 | 21,730 | 14,612 | 15,003 |
| 22       | 22,996  | 21,830 | 26,663 | 24,230 | 25,457 | 20,121  | 18,390 | 22,948 | 15,431 | 15,838 |
| 23       | 24,133  | 22,239 | 28,161 | 24,985 | 26,889 | 20,873  | 19,338 | 24,116 | 16,216 | 16,638 |
| 24       | 25,625  | 22,972 | 29,938 | 25,477 | 28,616 | 21,906  | 20,312 | 25,417 | 17,073 | 17,507 |
| 25       | 27,516  | 24,106 | 31,953 | 25,741 | 30,508 | 23,322  | 21,137 | 26,919 | 17,994 | 18,618 |
| 26       | 29,289  | 25,391 | 33,835 | 25,977 | 31,832 | 24,547  | 21,692 | 28,107 | 18,775 | 20,124 |
| 27       | 30,408  | 26,561 | 35,008 | 26,393 | 32,223 | 25,203  | 22,302 | 28,521 | 19,337 | 21,666 |
| 28       | 31,115  | 27,422 | 35,341 | 26,975 | 31,825 | 25,484  | 23,302 | 28,428 | 19,891 | 22,594 |
| 29       | 31,984  | 28,160 | 34,803 | 27,361 | 31,027 | 25,736  | 24,524 | 27,810 | 20,583 | 22,906 |
| 30       | 33,123  | 28,980 | 33,306 | 27,646 | 30,628 | 26,271  | 25,358 | 26,540 | 21,483 | 23,428 |
| 31       | 34,291  | 29,781 | 31,874 | 28,514 | 31,885 | 27,023  | 25,573 | 25,294 | 22,764 | 25,270 |
| 32       | 35,314  | 30,563 | 31,346 | 30,150 | 34,399 | 27,500  | 25,560 | 24,611 | 24,124 | 27,619 |
| 33       | 36,131  | 31,279 | 31,614 | 31,922 | 35,656 | 27,514  | 25,560 | 24,344 | 24,969 | 28,583 |
| 34       | 36,881  | 31,705 | 33,304 | 33,434 | 35,229 | 27,455  | 25,541 | 24,271 | 25,324 | 28,186 |
| 35       | 37,768  | 32,156 | 36,904 | 34,895 | 34,262 | 27,703  | 25,503 | 24,455 | 25,500 | 27,140 |
| 36       | 38,645  | 33,525 | 40,322 | 36,682 | 33,611 | 28,318  | 25,484 | 25,236 | 25,543 | 26,225 |
| 37       | 39,381  | 35,404 | 41,508 | 38,807 | 33,656 | 29,080  | 25,299 | 26,617 | 25,516 | 25,945 |
| 38       | 40,100  | 36,375 | 41,393 | 40,387 | 35,041 | 29,539  | 24,928 | 27,787 | 25,514 | 25,957 |
| 39       | 40,625  | 36,324 | 40,863 | 40,867 | 38,766 | 29,617  | 24,742 | 28,184 | 25,514 | 26,076 |
| 40       | 40,875  | 35,973 | 39,432 | 39,402 | 42,686 | 29,529  | 24,785 | 28,262 | 25,539 | 26,322 |
| 41       | 41,188  | 35,762 | 36,988 | 35,375 | 44,109 | 29,400  | 25,010 | 28,453 | 25,736 | 26,697 |
| 42       | 41,625  | 35,609 | 34,855 | 31,715 | 43,451 | 29,344  | 25,363 | 28,807 | 26,180 | 27,154 |
| 43       | 42,135  | 35,346 | 34,148 | 30,617 | 41,602 | 29,396  | 25,725 | 29,201 | 26,674 | 27,563 |
| 44       | 42,748  | 35,135 | 34,969 | 31,025 | 39,877 | 29,631  | 26,258 | 29,367 | 26,996 | 27,957 |
| 45       | 43,195  | 35,070 | 37,295 | 32,852 | 39,344 | 30,084  | 26,828 | 29,320 | 27,133 | 28,637 |
| 46       | 43,299  | 35,563 | 39,994 | 36,307 | 39,389 | 30,561  | 27,094 | 29,182 | 27,152 | 29,391 |
| 47       | 43,287  | 36,797 | 41,727 | 39,746 | 39,666 | 30,811  | 27,164 | 29,045 | 26,953 | 29,688 |
| 48       | 43,422  | 37,902 | 42,297 | 41,523 | 40,211 | 30,824  | 27,307 | 28,969 | 26,258 | 29,617 |
| 49       | 43,732  | 38,475 | 42,225 | 41,887 | 40,711 | 30,768  | 27,498 | 28,795 | 25,254 | 29,391 |
| 50       | 44,010  | 38,967 | 41,639 | 41,230 | 40,992 | 30,730  | 27,391 | 28,461 | 24,594 | 29,082 |
| 51       | 44,105  | 39,563 | 40,447 | 39,859 | 41,273 | 30,750  | 26,586 | 28,189 | 24,430 | 28,797 |
| 52       | 44,113  | 40,031 | 39,408 | 39,039 | 42,002 | 30,852  | 25,164 | 28,109 | 24,512 | 28,488 |
| 53       | 44,117  | 40,219 | 39,078 | 38,955 | 43,127 | 30,963  | 23,934 | 28,262 | 24,857 | 28,109 |
| 54       | 43,994  | 40,250 | 39,582 | 38,975 | 43,910 | 31,006  | 23,457 | 28,643 | 25,443 | 27,781 |
| 55       | 43,748  | 40,547 | 40,590 | 38,984 | 44,109 | 31,008  | 23,469 | 28,947 | 25,979 | 27,588 |
| 56       | 43,625  | 41,141 | 41,094 | 38,760 | 44,021 | 31,006  | 23,932 | 29,023 | 26,414 | 27,451 |
| 57       | 43,625  | 41,438 | 41,018 | 38,170 | 43,689 | 30,920  | 24,857 | 28,979 | 26,912 | 27,285 |
| 58       | 43,625  | 40,871 | 40,650 | 37,404 | 43,166 | 30,660  | 25,570 | 28,857 | 27,313 | 27,121 |
| 59       | 43,496  | 38,855 | 40,145 | 36,744 | 42,764 | 30,359  | 25,762 | 28,750 | 27,424 | 27,055 |
| 60       | 43,238  | 36,160 | 39,930 | 36,484 | 42,641 | 30,203  | 25,988 | 28,746 | 27,232 | 27,131 |
| 61       | 43,109  | 34,551 | 40,152 | 36,945 | 42,697 | 30,168  | 26,977 | 28,801 | 26,759 | 27,322 |
| 62       | 43,166  | 34,188 | 40,850 | 37,930 | 43,082 | 30,164  | 28,358 | 28,766 | 26,254 | 27,477 |
| 63       | 43,416  | 34,972 | 42,244 | 38,516 | 43,918 | 29,980  | 29,042 | 28,500 | 25,898 | 27,521 |
| 64       | 43,746  | 36,541 | 43,832 | 38,574 | 44,662 | 29,484  | 29,110 | 28,027 | 25,659 | 27,539 |
| 65       | 43,539  | 37,326 | 44,500 | 38,238 | 44,898 | 28,947  | 28,914 | 27,504 | 25,541 | 27,557 |
| 66       | 42,189  | 37,104 | 43,949 | 37,516 | 43,750 | 28,523  | 28,405 | 27,000 | 25,548 | 27,438 |
| 67       | 39,807  | 36,219 | 41,746 | 37,063 | 40,377 | 28,193  | 27,890 | 26,500 | 25,676 | 26,938 |
| 68       | 37,000  | 34,670 | 37,891 | 37,000 | 36,000 | 28,000  | 27,516 | 26,000 | 25,900 | 26,063 |

Figure 16. Age-Earnings Profile GED or Alternate Credential

| Age      | Males   |        |        |        |        | Females |        |        |        |        |
|----------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear   | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 41,500  | 33,500 | 39,500 | 37,500 | 43,500 | 31,000  | 27,500 | 30,000 | 28,000 | 30,500 |
| 18       | 17,031  | 15,453 | 17,555 | 14,638 | 15,322 | 16,000  | 15,414 | 17,633 | 15,510 | 17,616 |
| 19       | 19,313  | 17,643 | 19,615 | 16,336 | 17,128 | 16,695  | 16,017 | 18,239 | 16,542 | 18,708 |
| 20       | 21,063  | 19,426 | 21,398 | 17,834 | 18,765 | 17,773  | 16,599 | 18,602 | 17,633 | 19,599 |
| 21       | 22,438  | 20,446 | 22,940 | 19,553 | 20,445 | 18,971  | 17,223 | 18,741 | 18,793 | 20,271 |
| 22       | 23,813  | 20,975 | 24,362 | 21,989 | 22,420 | 20,008  | 17,965 | 19,013 | 19,905 | 21,016 |
| 23       | 25,369  | 21,434 | 25,806 | 25,088 | 24,774 | 21,047  | 19,181 | 20,106 | 20,765 | 22,262 |
| 24       | 27,215  | 22,107 | 27,823 | 28,103 | 27,583 | 22,465  | 20,875 | 21,916 | 21,513 | 23,819 |
| 25       | 29,174  | 23,289 | 29,884 | 30,004 | 30,387 | 24,135  | 22,231 | 23,180 | 22,549 | 24,922 |
| 26       | 30,750  | 24,830 | 30,688 | 30,650 | 32,258 | 25,391  | 22,883 | 23,502 | 24,313 | 25,301 |
| 27       | 31,793  | 25,975 | 30,350 | 30,544 | 32,975 | 26,100  | 23,139 | 23,424 | 26,219 | 25,275 |
| 28       | 32,594  | 26,484 | 29,674 | 30,209 | 33,158 | 26,662  | 23,193 | 23,258 | 26,992 | 25,264 |
| 29       | 33,348  | 26,938 | 29,336 | 30,016 | 33,398 | 27,156  | 23,316 | 23,387 | 26,711 | 25,551 |
| 30       | 34,219  | 27,561 | 29,217 | 29,953 | 33,693 | 27,449  | 23,797 | 23,969 | 25,924 | 26,102 |
| 31       | 35,375  | 28,166 | 29,010 | 30,094 | 33,807 | 27,664  | 24,328 | 24,816 | 25,192 | 26,582 |
| 32       | 36,625  | 28,791 | 29,082 | 30,469 | 33,623 | 28,008  | 24,672 | 25,969 | 24,967 | 27,168 |
| 33       | 37,656  | 29,750 | 29,371 | 31,125 | 33,236 | 28,477  | 25,078 | 27,203 | 25,029 | 27,992 |
| 34       | 38,527  | 31,006 | 29,938 | 32,098 | 33,008 | 29,012  | 25,441 | 27,918 | 25,160 | 28,430 |
| 35       | 39,457  | 31,998 | 31,762 | 33,168 | 33,297 | 29,639  | 25,605 | 28,131 | 25,584 | 28,424 |
| 36       | 40,357  | 32,510 | 34,723 | 34,092 | 34,533 | 30,225  | 25,688 | 28,236 | 26,376 | 28,059 |
| 37       | 41,035  | 32,797 | 36,953 | 34,525 | 36,551 | 30,563  | 25,844 | 28,289 | 26,962 | 27,439 |
| 38       | 41,521  | 32,984 | 37,734 | 34,473 | 38,746 | 30,719  | 26,156 | 27,814 | 27,147 | 27,148 |
| 39       | 41,951  | 33,047 | 37,848 | 34,115 | 40,842 | 30,844  | 26,502 | 26,865 | 27,153 | 27,326 |
| 40       | 42,473  | 33,109 | 37,730 | 33,818 | 42,242 | 30,969  | 27,053 | 26,391 | 27,154 | 28,012 |
| 41       | 43,084  | 33,252 | 37,625 | 33,906 | 42,602 | 31,129  | 27,867 | 26,645 | 27,578 | 29,273 |
| 42       | 43,578  | 33,572 | 37,625 | 34,313 | 42,477 | 31,324  | 28,414 | 27,246 | 28,635 | 30,451 |
| 43       | 43,926  | 34,646 | 37,719 | 35,715 | 42,398 | 31,453  | 28,412 | 27,719 | 29,594 | 30,875 |
| 44       | 44,344  | 36,313 | 37,945 | 37,803 | 42,682 | 31,547  | 28,109 | 27,854 | 29,891 | 30,584 |
| 45       | 44,893  | 37,365 | 38,211 | 38,959 | 43,311 | 31,797  | 27,885 | 27,842 | 29,469 | 29,307 |
| 46       | 45,414  | 37,584 | 38,656 | 39,166 | 43,719 | 32,172  | 27,836 | 27,914 | 28,346 | 27,625 |
| 47       | 45,891  | 37,434 | 39,375 | 39,063 | 43,709 | 32,461  | 28,180 | 28,488 | 27,365 | 26,930 |
| 48       | 46,408  | 37,102 | 40,250 | 38,865 | 43,564 | 32,695  | 28,867 | 29,611 | 27,086 | 27,193 |
| 49       | 46,920  | 36,867 | 41,156 | 38,789 | 43,617 | 33,016  | 29,211 | 30,572 | 27,135 | 28,125 |
| 50       | 47,338  | 36,834 | 41,938 | 38,789 | 44,336 | 33,328  | 29,131 | 30,953 | 27,299 | 29,395 |
| 51       | 47,543  | 37,115 | 42,469 | 38,973 | 45,633 | 33,482  | 28,684 | 31,014 | 27,488 | 30,363 |
| 52       | 47,535  | 38,258 | 42,656 | 39,572 | 46,602 | 33,508  | 27,984 | 31,010 | 27,695 | 31,025 |
| 53       | 47,500  | 39,977 | 42,256 | 40,379 | 46,930 | 33,502  | 27,607 | 31,006 | 28,109 | 31,445 |
| 54       | 47,500  | 41,010 | 41,455 | 41,031 | 47,021 | 33,500  | 27,563 | 31,002 | 28,674 | 31,529 |
| 55       | 47,500  | 41,203 | 41,055 | 41,396 | 47,049 | 33,500  | 27,967 | 30,965 | 29,178 | 31,402 |
| 56       | 47,469  | 40,848 | 41,139 | 41,469 | 46,930 | 33,500  | 28,967 | 30,814 | 29,492 | 31,271 |
| 57       | 47,311  | 39,537 | 41,363 | 40,924 | 46,625 | 33,500  | 29,754 | 30,605 | 29,586 | 31,227 |
| 58       | 46,926  | 37,570 | 41,594 | 39,406 | 46,367 | 33,500  | 29,945 | 30,498 | 29,586 | 31,354 |
| 59       | 46,287  | 36,146 | 41,801 | 37,881 | 46,305 | 33,500  | 29,611 | 30,484 | 29,107 | 31,766 |
| 60       | 45,500  | 35,734 | 42,002 | 37,359 | 46,322 | 33,500  | 28,943 | 30,625 | 28,150 | 32,240 |
| 61       | 44,844  | 36,117 | 42,086 | 37,523 | 46,420 | 33,553  | 28,578 | 31,141 | 27,672 | 32,461 |
| 62       | 44,564  | 36,883 | 41,963 | 38,199 | 46,221 | 33,691  | 28,516 | 31,930 | 27,809 | 32,488 |
| 63       | 44,645  | 37,266 | 41,498 | 39,061 | 45,311 | 33,811  | 28,484 | 32,523 | 28,113 | 32,369 |
| 64       | 44,768  | 36,441 | 40,715 | 39,506 | 44,303 | 33,813  | 28,061 | 32,703 | 28,313 | 32,010 |
| 65       | 44,438  | 34,793 | 39,602 | 39,693 | 43,439 | 33,609  | 27,214 | 32,418 | 28,344 | 31,508 |
| 66       | 43,205  | 33,969 | 37,848 | 39,744 | 41,629 | 33,104  | 26,791 | 31,434 | 28,471 | 31,000 |
| 67       | 40,869  | 33,969 | 35,758 | 39,586 | 38,104 | 32,252  | 26,791 | 29,844 | 28,979 | 30,500 |
| 68       | 37,742  | 33,969 | 34,000 | 39,313 | 33,500 | 31,086  | 26,791 | 28,000 | 29,867 | 30,000 |

Figure 17. Age-Earnings Profile High School Graduate



| Age      | Males   |        |        |        |        | Females |        |        |        |        |
|----------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear   | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 49,000  | 41,000 | 46,500 | 42,000 | 50,500 | 36,500  | 31,000 | 35,000 | 32,500 | 35,500 |
| 20       | 20,000  | 20,008 | 21,211 | 15,640 | 21,229 | 17,500  | 17,500 | 16,888 | 18,742 | 14,666 |
| 21       | 21,746  | 21,008 | 23,105 | 17,834 | 23,147 | 19,428  | 17,982 | 18,551 | 18,742 | 16,133 |
| 22       | 23,551  | 22,227 | 25,133 | 20,813 | 24,728 | 20,908  | 18,885 | 19,920 | 18,742 | 17,441 |
| 23       | 25,609  | 23,945 | 27,055 | 24,756 | 26,424 | 22,242  | 19,887 | 20,894 | 19,338 | 18,685 |
| 24       | 28,121  | 26,008 | 28,206 | 27,936 | 28,294 | 24,002  | 20,760 | 21,779 | 21,182 | 20,065 |
| 25       | 30,867  | 28,039 | 28,468 | 28,942 | 29,633 | 26,096  | 21,727 | 22,983 | 23,484 | 21,884 |
| 26       | 33,305  | 29,633 | 28,598 | 28,562 | 31,011 | 27,848  | 23,328 | 24,360 | 25,090 | 24,349 |
| 27       | 35,332  | 30,605 | 29,279 | 27,877 | 33,122 | 29,016  | 25,281 | 25,501 | 25,945 | 26,564 |
| 28       | 37,156  | 31,436 | 31,103 | 28,391 | 35,324 | 29,928  | 26,586 | 26,511 | 26,531 | 27,516 |
| 29       | 38,813  | 32,584 | 34,108 | 31,156 | 36,951 | 30,773  | 27,180 | 27,661 | 26,959 | 27,641 |
| 30       | 40,328  | 34,209 | 36,982 | 35,221 | 37,840 | 31,475  | 27,602 | 28,876 | 27,158 | 27,500 |
| 31       | 41,705  | 36,277 | 38,656 | 38,896 | 38,537 | 32,014  | 28,008 | 29,716 | 27,336 | 27,219 |
| 32       | 42,912  | 37,924 | 38,994 | 40,898 | 39,406 | 32,498  | 28,289 | 30,082 | 27,805 | 27,078 |
| 33       | 44,133  | 38,504 | 38,641 | 41,057 | 40,230 | 33,023  | 28,414 | 30,859 | 28,930 | 27,258 |
| 34       | 45,650  | 38,676 | 38,670 | 40,328 | 41,598 | 33,617  | 28,783 | 32,297 | 30,531 | 28,016 |
| 35       | 47,420  | 39,217 | 39,297 | 39,803 | 43,875 | 34,252  | 29,754 | 33,359 | 31,736 | 29,432 |
| 36       | 48,986  | 40,322 | 40,467 | 39,695 | 46,000 | 34,928  | 30,682 | 33,641 | 32,311 | 31,500 |
| 37       | 50,078  | 41,926 | 42,359 | 40,803 | 47,297 | 35,625  | 30,977 | 33,510 | 32,844 | 33,803 |
| 38       | 50,969  | 43,404 | 44,447 | 43,455 | 47,949 | 36,250  | 30,777 | 33,148 | 33,633 | 35,156 |
| 39       | 51,842  | 44,041 | 45,844 | 45,438 | 48,119 | 36,717  | 30,379 | 32,818 | 34,273 | 35,332 |
| 40       | 52,477  | 44,109 | 46,307 | 45,703 | 48,154 | 37,023  | 30,180 | 32,719 | 34,430 | 34,506 |
| 41       | 52,863  | 43,754 | 46,193 | 44,875 | 48,266 | 37,322  | 30,529 | 32,801 | 33,943 | 33,170 |
| 42       | 53,285  | 42,885 | 45,727 | 43,734 | 48,393 | 37,711  | 31,322 | 33,057 | 33,088 | 32,555 |
| 43       | 53,799  | 42,211 | 45,191 | 43,250 | 48,518 | 38,102  | 31,859 | 33,322 | 32,680 | 32,912 |
| 44       | 54,357  | 42,021 | 44,973 | 43,426 | 48,797 | 38,492  | 31,828 | 33,377 | 32,680 | 33,840 |
| 45       | 55,031  | 41,996 | 45,273 | 44,074 | 49,234 | 38,953  | 31,467 | 33,279 | 32,711 | 34,842 |
| 46       | 55,656  | 42,152 | 46,650 | 44,875 | 49,725 | 39,422  | 31,119 | 33,207 | 32,809 | 35,648 |
| 47       | 55,963  | 42,865 | 48,467 | 45,291 | 50,486 | 39,797  | 31,195 | 33,207 | 32,928 | 36,229 |
| 48       | 56,006  | 44,201 | 49,219 | 45,486 | 51,648 | 40,111  | 31,988 | 33,313 | 33,334 | 36,482 |
| 49       | 56,016  | 45,344 | 49,129 | 45,645 | 53,031 | 40,469  | 33,613 | 34,072 | 34,055 | 36,531 |
| 50       | 56,195  | 45,742 | 48,889 | 45,695 | 54,262 | 40,807  | 35,484 | 35,621 | 34,453 | 36,656 |
| 51       | 56,680  | 45,736 | 48,678 | 45,346 | 55,012 | 41,012  | 36,586 | 36,908 | 34,416 | 36,906 |
| 52       | 57,211  | 45,631 | 48,617 | 44,516 | 55,242 | 41,172  | 36,820 | 37,438 | 34,279 | 37,094 |
| 53       | 57,414  | 45,438 | 48,617 | 43,904 | 55,080 | 41,359  | 36,449 | 37,557 | 34,117 | 37,277 |
| 54       | 57,332  | 45,219 | 48,617 | 43,773 | 54,648 | 41,484  | 35,713 | 37,430 | 33,930 | 37,457 |
| 55       | 57,064  | 44,863 | 48,707 | 43,773 | 54,271 | 41,514  | 35,082 | 37,121 | 33,836 | 37,516 |
| 56       | 56,744  | 44,254 | 48,900 | 43,930 | 54,164 | 41,510  | 34,436 | 36,787 | 33,867 | 37,398 |
| 57       | 56,512  | 43,820 | 49,018 | 44,324 | 54,195 | 41,471  | 33,852 | 36,586 | 33,930 | 37,164 |
| 58       | 56,215  | 43,734 | 49,031 | 44,738 | 54,299 | 41,314  | 33,664 | 36,520 | 34,055 | 37,047 |
| 59       | 55,727  | 44,578 | 48,805 | 45,182 | 54,412 | 41,113  | 33,736 | 36,582 | 34,404 | 37,375 |
| 60       | 55,094  | 46,391 | 48,211 | 45,623 | 54,297 | 41,031  | 33,982 | 36,891 | 34,852 | 38,379 |
| 61       | 54,469  | 47,484 | 47,703 | 45,797 | 53,859 | 41,098  | 34,299 | 37,346 | 35,076 | 39,402 |
| 62       | 54,094  | 47,410 | 47,563 | 45,814 | 53,453 | 41,338  | 34,552 | 37,666 | 35,108 | 39,758 |
| 63       | 53,939  | 47,011 | 47,531 | 45,850 | 53,432 | 41,619  | 34,724 | 37,773 | 35,108 | 40,041 |
| 64       | 53,641  | 46,771 | 47,406 | 45,707 | 53,639 | 41,729  | 34,771 | 37,693 | 35,128 | 40,721 |
| 65       | 53,100  | 46,692 | 46,672 | 45,387 | 53,367 | 41,545  | 34,598 | 37,330 | 35,167 | 41,262 |
| 66       | 52,234  | 46,393 | 44,703 | 45,227 | 51,346 | 40,818  | 33,861 | 36,586 | 35,187 | 40,742 |
| 67       | 50,359  | 45,351 | 42,281 | 45,227 | 47,139 | 39,217  | 32,108 | 35,367 | 35,187 | 38,117 |
| 68       | 47,297  | 43,528 | 40,500 | 45,227 | 42,000 | 36,742  | 29,444 | 33,617 | 35,187 | 33,523 |

Figure 18. Age-Earnings Profile Some College, No Degree

| Age      | Males   |        |        |        | Females |         |        |        |        |        |
|----------|---------|--------|--------|--------|---------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear    | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 52,000  | 43,500 | 49,000 | 48,000 | 54,000  | 41,500  | 34,000 | 39,000 | 38,000 | 40,000 |
| 21       | 24,813  | 18,987 | 21,947 | 22,602 | 22,247  | 20,461  | 21,542 | 17,003 | 13,665 | 19,543 |
| 22       | 26,531  | 20,886 | 23,644 | 24,352 | 23,968  | 22,461  | 22,117 | 18,737 | 15,968 | 21,539 |
| 23       | 28,625  | 24,125 | 25,609 | 26,378 | 25,960  | 24,617  | 22,617 | 20,608 | 19,551 | 23,556 |
| 24       | 31,307  | 27,949 | 27,955 | 28,781 | 28,338  | 27,158  | 23,307 | 22,623 | 23,912 | 25,306 |
| 25       | 34,295  | 30,516 | 30,525 | 31,432 | 30,940  | 29,709  | 24,447 | 24,546 | 27,156 | 26,874 |
| 26       | 37,070  | 31,891 | 32,964 | 33,997 | 33,400  | 31,563  | 26,167 | 26,093 | 28,820 | 29,002 |
| 27       | 39,445  | 33,578 | 34,932 | 35,952 | 35,452  | 32,719  | 28,014 | 27,394 | 30,055 | 31,188 |
| 28       | 41,352  | 36,064 | 36,205 | 37,037 | 36,909  | 33,656  | 29,094 | 29,038 | 31,521 | 32,155 |
| 29       | 42,758  | 38,287 | 36,833 | 37,630 | 37,577  | 34,686  | 29,320 | 31,001 | 32,965 | 32,093 |
| 30       | 44,012  | 39,273 | 37,263 | 38,273 | 37,555  | 35,838  | 29,336 | 32,311 | 33,977 | 31,691 |
| 31       | 45,525  | 39,311 | 37,946 | 39,408 | 37,542  | 36,930  | 29,438 | 32,647 | 34,516 | 31,355 |
| 32       | 47,197  | 39,041 | 38,991 | 41,406 | 38,763  | 37,746  | 29,924 | 32,500 | 34,885 | 31,859 |
| 33       | 48,672  | 39,141 | 40,473 | 44,559 | 42,529  | 38,254  | 30,959 | 32,164 | 35,402 | 34,254 |
| 34       | 50,078  | 40,137 | 42,451 | 48,453 | 48,177  | 38,695  | 31,789 | 31,906 | 35,977 | 37,730 |
| 35       | 51,578  | 41,670 | 44,547 | 51,285 | 52,744  | 39,291  | 32,070 | 32,031 | 36,443 | 39,938 |
| 36       | 52,891  | 42,969 | 46,102 | 52,125 | 54,729  | 40,057  | 32,352 | 32,793 | 37,045 | 40,490 |
| 37       | 53,961  | 43,795 | 46,760 | 51,658 | 55,125  | 40,928  | 33,441 | 34,098 | 37,723 | 40,471 |
| 38       | 54,852  | 44,203 | 46,795 | 50,197 | 54,928  | 41,725  | 34,996 | 35,359 | 38,078 | 40,416 |
| 39       | 55,578  | 44,197 | 46,797 | 48,514 | 54,105  | 42,289  | 35,680 | 36,068 | 38,129 | 40,354 |
| 40       | 56,453  | 43,898 | 47,078 | 47,662 | 53,053  | 42,729  | 35,295 | 36,240 | 38,094 | 40,141 |
| 41       | 57,434  | 43,600 | 47,547 | 47,254 | 52,625  | 43,150  | 34,525 | 36,301 | 38,047 | 39,621 |
| 42       | 58,020  | 43,656 | 47,891 | 46,488 | 52,664  | 43,426  | 34,141 | 36,555 | 37,926 | 39,006 |
| 43       | 58,318  | 44,488 | 48,111 | 45,695 | 53,008  | 43,568  | 35,207 | 37,139 | 37,742 | 38,713 |
| 44       | 58,877  | 46,486 | 48,828 | 45,422 | 53,754  | 43,863  | 37,340 | 37,998 | 37,656 | 38,773 |
| 45       | 59,820  | 48,830 | 50,131 | 46,285 | 54,371  | 44,381  | 38,406 | 38,652 | 37,988 | 39,463 |
| 46       | 60,930  | 50,070 | 51,094 | 48,367 | 54,547  | 44,867  | 38,178 | 38,844 | 39,018 | 41,033 |
| 47       | 61,688  | 50,236 | 51,250 | 49,973 | 54,371  | 45,188  | 37,477 | 38,738 | 40,080 | 42,480 |
| 48       | 61,918  | 49,684 | 51,063 | 50,521 | 54,020  | 45,457  | 36,697 | 38,426 | 40,445 | 42,953 |
| 49       | 62,137  | 48,736 | 50,969 | 50,971 | 53,844  | 45,791  | 36,328 | 38,117 | 39,869 | 41,957 |
| 50       | 62,416  | 48,289 | 51,430 | 51,570 | 54,539  | 46,150  | 36,234 | 38,047 | 38,561 | 39,965 |
| 51       | 62,514  | 49,178 | 52,352 | 52,164 | 55,930  | 46,445  | 36,141 | 38,814 | 37,672 | 38,969 |
| 52       | 62,516  | 50,955 | 52,813 | 52,570 | 56,625  | 46,770  | 36,086 | 40,506 | 37,531 | 39,387 |
| 53       | 62,484  | 51,844 | 52,594 | 52,689 | 56,063  | 47,168  | 36,133 | 41,711 | 37,639 | 40,637 |
| 54       | 62,369  | 51,074 | 52,066 | 52,566 | 54,938  | 47,465  | 36,279 | 41,867 | 37,807 | 42,111 |
| 55       | 62,107  | 48,750 | 51,668 | 52,295 | 54,375  | 47,598  | 36,912 | 41,680 | 37,961 | 43,141 |
| 56       | 61,547  | 46,168 | 51,578 | 51,916 | 55,340  | 47,627  | 37,949 | 41,648 | 38,242 | 43,830 |
| 57       | 60,615  | 44,898 | 51,691 | 51,510 | 57,270  | 47,615  | 38,555 | 42,105 | 38,977 | 44,539 |
| 58       | 59,498  | 44,656 | 51,971 | 51,328 | 58,234  | 47,609  | 38,576 | 42,832 | 40,736 | 45,207 |
| 59       | 58,434  | 44,684 | 52,189 | 51,490 | 58,125  | 47,609  | 38,432 | 43,164 | 43,205 | 45,469 |
| 60       | 57,594  | 45,090 | 52,211 | 51,988 | 57,600  | 47,715  | 38,359 | 42,943 | 44,863 | 45,379 |
| 61       | 57,094  | 46,181 | 51,779 | 52,498 | 56,596  | 47,953  | 38,297 | 42,471 | 45,281 | 45,029 |
| 62       | 56,920  | 47,597 | 51,010 | 52,641 | 55,664  | 48,125  | 37,984 | 42,188 | 44,926 | 44,516 |
| 63       | 56,986  | 48,776 | 50,641 | 52,016 | 55,285  | 48,145  | 36,889 | 42,195 | 43,844 | 44,098 |
| 64       | 57,230  | 49,385 | 50,668 | 50,529 | 55,027  | 47,813  | 34,605 | 42,285 | 42,556 | 43,695 |
| 65       | 57,293  | 49,366 | 50,723 | 49,289 | 53,617  | 46,695  | 31,985 | 42,285 | 41,805 | 43,107 |
| 66       | 56,289  | 48,347 | 50,469 | 48,330 | 49,787  | 44,992  | 30,153 | 41,609 | 41,614 | 42,473 |
| 67       | 53,258  | 45,755 | 49,344 | 45,938 | 44,006  | 43,406  | 28,995 | 39,672 | 41,614 | 42,094 |
| 68       | 48,320  | 42,000 | 47,375 | 41,781 | 38,000  | 42,094  | 27,972 | 36,859 | 41,614 | 42,000 |

Figure 19. Age-Earnings Profile Associate Degree

| Age      | Males   |        |        |        |        | Females |        |        |        |        |
|----------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear   | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 73,000  | 57,000 | 63,500 | 60,500 | 68,500 | 52,000  | 44,500 | 48,500 | 48,500 | 51,000 |
| 22       | 31,211  | 29,944 | 22,370 | 26,559 | 32,567 | 27,172  | 23,517 | 27,601 | 20,904 | 23,460 |
| 23       | 35,711  | 33,985 | 25,530 | 30,531 | 37,287 | 31,203  | 27,253 | 31,680 | 25,097 | 26,880 |
| 24       | 39,867  | 37,433 | 28,501 | 34,932 | 41,668 | 34,953  | 30,223 | 35,460 | 29,097 | 30,043 |
| 25       | 43,613  | 39,914 | 31,200 | 39,024 | 45,169 | 38,203  | 32,156 | 38,724 | 32,798 | 32,919 |
| 26       | 46,990  | 41,516 | 33,629 | 41,621 | 47,401 | 40,762  | 34,008 | 41,388 | 36,789 | 35,798 |
| 27       | 50,031  | 43,053 | 35,807 | 43,030 | 48,344 | 42,754  | 36,289 | 43,080 | 40,916 | 38,740 |
| 28       | 52,768  | 45,360 | 37,780 | 44,406 | 48,452 | 44,512  | 38,320 | 43,593 | 43,539 | 41,325 |
| 29       | 55,326  | 47,818 | 39,614 | 45,563 | 48,443 | 46,105  | 39,723 | 42,520 | 43,908 | 43,337 |
| 30       | 57,928  | 49,188 | 41,393 | 46,504 | 49,109 | 47,438  | 40,486 | 40,307 | 43,271 | 44,973 |
| 31       | 60,523  | 49,605 | 43,622 | 48,984 | 50,695 | 48,680  | 40,682 | 39,099 | 42,953 | 46,506 |
| 32       | 62,852  | 50,092 | 47,494 | 52,992 | 52,828 | 50,055  | 40,891 | 39,031 | 44,240 | 48,274 |
| 33       | 65,172  | 51,279 | 52,171 | 56,549 | 56,418 | 51,422  | 41,953 | 39,602 | 47,584 | 49,835 |
| 34       | 68,123  | 53,311 | 55,159 | 59,041 | 61,355 | 52,697  | 44,172 | 41,375 | 50,598 | 50,403 |
| 35       | 71,535  | 56,104 | 56,270 | 60,633 | 64,711 | 54,027  | 47,023 | 43,512 | 51,805 | 50,193 |
| 36       | 74,568  | 58,859 | 56,536 | 61,076 | 65,289 | 55,229  | 49,320 | 45,396 | 51,955 | 49,413 |
| 37       | 76,752  | 60,609 | 56,736 | 60,096 | 64,740 | 56,008  | 50,234 | 47,029 | 51,693 | 48,484 |
| 38       | 77,975  | 61,578 | 57,813 | 58,742 | 64,564 | 56,561  | 50,189 | 47,836 | 51,531 | 48,125 |
| 39       | 78,648  | 62,203 | 59,906 | 58,500 | 65,109 | 57,125  | 49,395 | 48,096 | 51,531 | 49,613 |
| 40       | 79,781  | 62,578 | 61,922 | 59,031 | 66,758 | 57,578  | 48,221 | 48,271 | 51,668 | 52,590 |
| 41       | 81,641  | 62,850 | 63,359 | 59,344 | 69,148 | 57,848  | 47,703 | 48,313 | 51,941 | 54,078 |
| 42       | 83,367  | 62,805 | 64,344 | 59,652 | 70,609 | 58,131  | 48,893 | 48,313 | 51,605 | 53,395 |
| 43       | 84,301  | 62,494 | 64,762 | 60,207 | 70,857 | 58,594  | 51,271 | 48,313 | 50,660 | 52,027 |
| 44       | 84,824  | 62,344 | 65,098 | 60,484 | 70,762 | 59,184  | 52,461 | 48,201 | 50,328 | 51,344 |
| 45       | 85,846  | 62,344 | 65,941 | 61,154 | 70,605 | 59,809  | 51,352 | 47,844 | 50,547 | 51,945 |
| 46       | 87,332  | 62,656 | 66,887 | 62,838 | 70,697 | 60,477  | 49,133 | 47,463 | 50,563 | 53,332 |
| 47       | 88,320  | 63,564 | 67,188 | 64,240 | 71,645 | 61,102  | 48,023 | 47,547 | 50,500 | 54,344 |
| 48       | 88,549  | 64,607 | 67,063 | 64,715 | 73,502 | 61,461  | 48,998 | 48,793 | 50,395 | 54,613 |
| 49       | 88,516  | 66,188 | 66,959 | 65,061 | 75,768 | 61,547  | 51,104 | 50,691 | 50,184 | 54,531 |
| 50       | 88,500  | 68,289 | 66,877 | 66,652 | 77,961 | 61,547  | 52,391 | 51,656 | 50,297 | 53,744 |
| 51       | 88,512  | 69,258 | 66,893 | 69,619 | 79,430 | 61,555  | 52,551 | 51,701 | 51,621 | 52,545 |
| 52       | 88,563  | 69,119 | 67,078 | 71,775 | 79,883 | 61,541  | 52,465 | 51,572 | 53,613 | 52,008 |
| 53       | 88,629  | 68,330 | 67,248 | 72,297 | 79,676 | 61,459  | 52,188 | 51,711 | 54,500 | 52,076 |
| 54       | 88,469  | 66,418 | 67,164 | 71,139 | 78,934 | 61,305  | 51,906 | 52,521 | 54,480 | 52,781 |
| 55       | 87,521  | 63,969 | 66,281 | 68,553 | 78,121 | 61,023  | 51,438 | 53,486 | 54,441 | 54,736 |
| 56       | 85,664  | 62,281 | 64,859 | 66,762 | 77,721 | 60,586  | 49,811 | 53,859 | 54,283 | 56,867 |
| 57       | 83,775  | 61,763 | 64,195 | 66,355 | 77,338 | 60,055  | 47,123 | 53,609 | 53,975 | 57,742 |
| 58       | 82,438  | 61,906 | 64,232 | 66,557 | 76,352 | 59,461  | 44,880 | 52,996 | 53,742 | 57,805 |
| 59       | 81,141  | 62,260 | 64,307 | 66,748 | 74,557 | 58,900  | 43,756 | 52,488 | 53,375 | 56,881 |
| 60       | 79,676  | 63,605 | 64,355 | 66,449 | 72,563 | 58,404  | 43,300 | 52,188 | 52,547 | 53,920 |
| 61       | 78,727  | 68,002 | 64,441 | 66,016 | 70,688 | 57,770  | 42,954 | 51,906 | 51,273 | 50,770 |
| 62       | 78,484  | 74,249 | 64,703 | 64,772 | 68,928 | 57,027  | 42,495 | 51,781 | 49,383 | 49,656 |
| 63       | 78,381  | 78,083 | 65,326 | 61,547 | 67,865 | 56,484  | 41,988 | 51,500 | 47,301 | 50,070 |
| 64       | 78,086  | 78,915 | 66,072 | 57,201 | 67,533 | 56,102  | 41,465 | 50,313 | 45,962 | 50,898 |
| 65       | 77,389  | 78,443 | 66,383 | 54,031 | 66,898 | 55,395  | 40,764 | 48,465 | 45,273 | 51,313 |
| 66       | 75,672  | 75,705 | 65,986 | 52,916 | 65,117 | 53,816  | 39,200 | 47,102 | 43,585 | 50,234 |
| 67       | 72,203  | 68,056 | 64,400 | 52,796 | 61,711 | 51,344  | 35,552 | 46,363 | 38,608 | 48,078 |
| 68       | 67,141  | 55,496 | 61,625 | 52,796 | 56,648 | 48,500  | 29,681 | 45,625 | 30,248 | 47,000 |

Figure 20. Age-Earnings Profile Baccalaureate Degree

| Age      | Males   |        |        |        | Females |         |        |        |        |        |
|----------|---------|--------|--------|--------|---------|---------|--------|--------|--------|--------|
|          | No Dis. | Cog.   | Mobil. | Vision | Hear    | No Dis. | Cog.   | Mobil. | Vision | Hear   |
| All Ages | 99,000  | 72,000 | 78,000 | 81,000 | 92,000  | 67,500  | 56,500 | 61,000 | 61,500 | 66,500 |
| 24       | 45,570  | 36,992 | 33,894 | 38,878 | 42,285  | 40,539  | 32,728 | 32,953 | 36,298 | 40,734 |
| 25       | 50,820  | 40,919 | 37,492 | 42,992 | 47,058  | 44,205  | 35,405 | 35,783 | 39,063 | 44,158 |
| 26       | 55,164  | 44,474 | 40,727 | 46,566 | 51,153  | 47,291  | 37,504 | 38,374 | 40,730 | 47,258 |
| 27       | 58,723  | 47,668 | 43,486 | 49,173 | 54,010  | 49,979  | 38,673 | 40,653 | 41,187 | 49,794 |
| 28       | 61,924  | 50,610 | 45,951 | 50,589 | 55,447  | 52,494  | 39,393 | 43,004 | 41,562 | 51,652 |
| 29       | 65,150  | 53,146 | 48,448 | 51,151 | 55,965  | 54,717  | 40,995 | 46,159 | 43,977 | 53,128 |
| 30       | 68,795  | 55,397 | 51,539 | 52,336 | 56,612  | 56,654  | 44,064 | 49,410 | 49,828 | 54,862 |
| 31       | 72,846  | 58,053 | 54,643 | 55,665 | 58,398  | 58,547  | 47,110 | 51,070 | 55,906 | 56,872 |
| 32       | 76,844  | 61,053 | 56,136 | 60,383 | 61,898  | 60,486  | 48,586 | 51,115 | 58,195 | 58,660 |
| 33       | 80,805  | 63,652 | 56,187 | 64,086 | 66,977  | 62,514  | 48,898 | 50,594 | 57,732 | 59,984 |
| 34       | 85,281  | 66,143 | 55,916 | 66,492 | 72,258  | 64,758  | 48,930 | 50,254 | 56,699 | 60,588 |
| 35       | 89,900  | 68,264 | 55,875 | 70,092 | 76,023  | 66,953  | 49,014 | 50,475 | 56,115 | 60,527 |
| 36       | 93,939  | 69,031 | 57,770 | 76,225 | 78,070  | 68,648  | 49,494 | 51,254 | 56,102 | 60,307 |
| 37       | 97,598  | 68,699 | 62,313 | 82,270 | 78,936  | 69,859  | 50,672 | 52,201 | 56,492 | 60,242 |
| 38       | 100,813 | 67,998 | 66,090 | 85,141 | 79,057  | 70,869  | 52,453 | 53,391 | 57,939 | 60,484 |
| 39       | 102,996 | 67,592 | 67,406 | 85,445 | 78,979  | 71,857  | 54,547 | 55,408 | 60,715 | 61,047 |
| 40       | 104,229 | 68,523 | 68,234 | 84,734 | 78,777  | 72,836  | 56,801 | 58,039 | 63,643 | 61,641 |
| 41       | 105,174 | 72,324 | 69,109 | 83,805 | 78,736  | 73,656  | 59,189 | 60,605 | 65,195 | 62,078 |
| 42       | 106,352 | 77,238 | 70,281 | 83,422 | 79,703  | 74,188  | 61,111 | 62,908 | 65,438 | 62,750 |
| 43       | 107,852 | 79,539 | 73,207 | 83,645 | 82,480  | 74,578  | 61,867 | 64,506 | 64,027 | 64,234 |
| 44       | 109,439 | 79,662 | 77,600 | 84,090 | 86,285  | 75,086  | 61,689 | 65,008 | 61,350 | 66,137 |
| 45       | 110,896 | 76,967 | 81,545 | 84,313 | 89,217  | 75,742  | 60,865 | 63,576 | 59,943 | 67,363 |
| 46       | 112,016 | 71,863 | 83,805 | 83,832 | 91,553  | 76,594  | 59,938 | 60,713 | 60,500 | 67,719 |
| 47       | 112,609 | 69,359 | 84,287 | 81,516 | 94,855  | 77,453  | 59,594 | 59,281 | 64,176 | 67,777 |
| 48       | 112,891 | 70,725 | 83,658 | 78,324 | 99,326  | 77,859  | 60,398 | 60,027 | 69,652 | 67,777 |
| 49       | 113,441 | 74,469 | 82,828 | 76,969 | 102,994 | 77,906  | 62,715 | 62,033 | 72,078 | 67,689 |
| 50       | 114,279 | 77,961 | 82,484 | 78,037 | 104,219 | 77,857  | 64,934 | 63,869 | 71,617 | 67,746 |
| 51       | 114,771 | 79,875 | 82,992 | 81,604 | 103,635 | 77,748  | 65,641 | 64,508 | 69,273 | 68,174 |
| 52       | 114,852 | 82,498 | 84,111 | 86,684 | 101,869 | 77,676  | 65,189 | 64,506 | 65,354 | 68,859 |
| 53       | 114,365 | 85,641 | 84,826 | 90,418 | 99,965  | 77,676  | 63,381 | 64,094 | 62,701 | 69,641 |
| 54       | 113,205 | 87,160 | 84,930 | 91,570 | 99,086  | 77,709  | 60,264 | 63,346 | 62,086 | 70,625 |
| 55       | 112,188 | 87,359 | 83,930 | 91,025 | 98,904  | 77,770  | 57,586 | 62,828 | 62,184 | 72,072 |
| 56       | 111,547 | 83,791 | 81,373 | 88,715 | 98,791  | 77,855  | 56,604 | 62,711 | 62,828 | 73,453 |
| 57       | 111,016 | 76,654 | 79,260 | 85,729 | 98,172  | 77,826  | 56,633 | 63,395 | 64,383 | 73,967 |
| 58       | 110,531 | 73,086 | 78,703 | 84,508 | 96,635  | 77,469  | 57,973 | 65,178 | 66,221 | 73,531 |
| 59       | 109,848 | 73,709 | 79,008 | 84,752 | 94,498  | 76,863  | 61,381 | 66,693 | 67,322 | 71,402 |
| 60       | 108,977 | 76,779 | 80,010 | 86,029 | 92,416  | 76,369  | 64,553 | 67,109 | 67,594 | 68,332 |
| 61       | 108,191 | 81,514 | 81,162 | 88,527 | 90,975  | 76,059  | 65,563 | 66,859 | 67,426 | 66,828 |
| 62       | 107,656 | 84,264 | 81,717 | 90,668 | 90,258  | 75,748  | 65,335 | 66,047 | 66,887 | 66,754 |
| 63       | 107,639 | 84,445 | 81,854 | 91,344 | 89,750  | 75,516  | 63,773 | 65,016 | 66,219 | 67,873 |
| 64       | 107,760 | 80,510 | 81,889 | 90,906 | 89,281  | 75,564  | 60,654 | 64,469 | 65,828 | 69,959 |
| 65       | 107,461 | 71,826 | 81,885 | 89,035 | 89,063  | 75,787  | 57,893 | 64,438 | 65,734 | 70,977 |
| 66       | 106,885 | 64,828 | 81,883 | 85,418 | 88,938  | 75,305  | 56,231 | 63,922 | 65,359 | 70,768 |
| 67       | 105,771 | 62,547 | 81,883 | 80,266 | 88,563  | 72,930  | 54,529 | 61,766 | 63,859 | 69,932 |
| 68       | 104,000 | 62,234 | 81,883 | 73,734 | 87,906  | 68,773  | 52,263 | 58,047 | 61,234 | 68,469 |

Figure 21. Age-Earnings Profile Master's Degree Plus



# Invisibility of Domestic Violence Among Persons with Disabilities in Human Service Professions

Sheri K. Anderson and Patrick L. Dunn

Domestic violence is recognized as a great social ill in American society, despite efforts by both state and federal governments to address these issues through criminal law and public resources. Victims of domestic violence often feel a lack of empowerment when confronting those who abuse them, and when they do they may face problems in regard to a lack of financial or emotional resources to begin recovery from the abuse. Persons with disabilities who are victims of abuse may often experience even greater negative effects as a result of the functional aspects of their disability, dependence on caretakers, or lack of knowledge or resources of law enforcement or social service agencies to meet their special needs when abuse is reported. This phenomenon is examined through a review of relevant literature, consideration of state and federal legislation intended to address domestic violence and its consequences, and recommendations for future action are discussed.

*Keywords:* abuse, domestic policy, consequences of violence

The development of enlightened humanism in Western civilization and law have led to the creation of principles concerning the dignity of human beings, and modern principles of human rights includes the principles that the dignity of an individual's mind, property, and body be protected to the greatest extent possible. In the United States, the federal Constitution and various state constitutions, as well as codified law and principles of common law, combine to protect these rights and punish those who violate the dignity of others. A discussion of the many ways in which the dignity of individuals is protected across the many facets of individual rights to dignity would necessitate a discussion of the entire breadth and majesty of law and finally to the realization that representative democracy exists to guarantee such rights to individuals and that the structure of law and government of this type exists to guarantee these rights and dignities to all.

One facet in this galaxy of rights and dignities involves the dignity of the individual from harm by others, and most specifically, from those that have a close or familial bond with the individual. Violation of these dignities by persons with close, familial relationships forms the essence of the phenomenon commonly known as domestic violence. The United States Department of Justice, Office on Violence against Women (2015), reports that domestic violence can be

physical, sexual, emotional, economic, or psychological, with specific actions or threats of actions that influence another person. Jones (2000), in her book *Next Time, She'll be Dead: Battering & How to Stop it*, provides an entire chapter dedicated to defining the term domestic violence. She describes domestic violence as "one of those gray phrases, beloved of bureaucracy, designed to give people a way of talking about a topic without seeing what's really going on." (p. 81). Domestic violence is largely viewed as a question of spousal abuse, and stereotypically with husband or male partner as the perpetrator of the violence and the wife or female partner as the victim of the violence. It may be suggested that crime statistics do seem to verify this pattern, and many statutes at the federal and state levels have been instituted to protect women in particular, from domestic or other forms of violence or abuse.

Review of current literature reveals large gaps in research, willingness or ability to report instances of domestic violence, and failure of law enforcement and courts to acknowledge the existence of domestic violence with regard to individuals with disabilities. Among professionals in the fields of either domestic violence or disability/rehabilitation there may be ethical and privacy constraints posing barriers to collecting and documenting data on the topic. Perpetuating lack of voluntary documentation is the inability of pro-

fessional validation of disability and or identification of abuse; i.e., what is “disability,” how is it defined, and how would a professional know it when they see it? Hughes, Lund, Gabrielli, Powers, and Curry (2011), reports needing agreement of definitions of both disability and violence that are comprehensive enough to explain what some persons with disabilities experience. It has been observed that textbooks intended for the education of professionals in the field of disability tend not to include data on the prevalence of domestic violence impacting those with disabilities and educational material intended for the domestic violence professional also lacks mention of information concerning disabilities. A lack of information or hard data to describe the phenomenon in this instance could be leading to a lack of awareness, therefore a lack of dissemination of the characteristics of this phenomenon.

Silence of individuals with disabilities themselves concerning domestic violence also confounds the lack of awareness. Depending on the disability, an individual may not understand contextually what has occurred to them, others may not have the communication skills to articulate violence perpetrated, and many may fear further violence, not being believed or loss of services if they report abuse. Finally, physical barriers to locations intended to assist and support those being victimized, such as public transportation to the location, architectural barriers and interpreter services at the location itself, and societal attitudes such as negative views about parents with disabilities, force those experiencing domestic violence to remain in the situation, and validates the statistics of invisibility. If cases of domestic violence are not being reported by those with disabilities, they cannot be documented, reported to legal authorities, investigated or eliminated.

This manuscript attempts to demystify the matter of domestic violence, and in particular, domestic violence concerning individuals with disabilities. Domestic violence in general will be defined and explained from legal and social sciences viewpoints. Resources to assist victims of domestic violence and those victims of domestic violence with disabilities are presented. Finally, the conclusions of the authors are presented concerning the need for additional research on this timely topic.

### **Defining Domestic Violence**

Research into domestic violence is complicated by the difficulty in operationally defining the term and those involved as both perpetrator and victim. The complexities involved in identifying persons with disabilities, especially in regard to domestic violence, due to the potential ambiguity of the terms are bluntly complicated. Terms such as “household” or “family” often

come to mind when one considers the term “domestic,” and refer to individual’s literal place of dwelling and others assigned to inhabit it. Such dwellings may be large or small, and may be shared with a family of one person or many people. When viewing a family structure from the historical setting, such as a mother or sibling caring for an adult with a congenital disability, or grandchild caring for a grandparent with an acquired disability, traditional understanding of these terms apply. For others with disabilities not living in such an environment, a dwelling could also include a group home found in a community, and the “family” could encompass the other individuals with disabilities that have been randomly assigned to this group home. Additionally, inhabitants might include personal care attendants, managers of the home. Other examples of dwellings might include assisted living facilities providing meal preparation and daily care by strangers, adult daycare environments with opportunities for individuals to build lasting relationships with those who assist them in daily tasks, and to a lesser degree, institutional settings in which individuals rarely spend time with blood relatives. When definitions expand, such as the family home becoming a group home with family members assigned and reassigned regularly and staff and other overseers paid to fulfill basic life chores, the power differential shifts. This shifting of power, redefining of family and service agencies becoming overseer’s causes a fault line of inconsistency and can lead to lack of boundaries. In such a dynamic environment, with many ever-changing participants and understanding of definitions, Lewin (2007) reported that because staff at such facilities may be abusers themselves, often this violence may not be reported.

### **Legal Definitions**

Many of the federal legal provisions relating specifically to domestic violence came to fruition as a result of the passage of the 1994 Violence Against Women Act (Pub. L. 103-322; codified at 42 U.S.C. §13701-14040). The Act provides definitions of domestic violence and related acts, such as stalking and elder abuse. The federal definition of domestic violence reads

felony or misdemeanor crimes of violence committed by a current or former spouse or intimate partner of the victim, by a person with whom the victim shares a child in common, by a person who is cohabitating with or has cohabitated with the victim as a spouse or intimate partner, by a person similarly situated to a spouse of the victim under the domestic or family violence laws of the jurisdiction receiving grant monies, or by any other person against an adult or youth victim who is protected from that person’s acts under the domestic or family violence laws of the jurisdiction (42 U.S.C. § 13925(a)(8)).

This act provides funding for various grant programs related to domestic violence, but also addresses matters of criminal and civil procedures and penalties concerning domestic violence, including applications towards those accused of such violence and their victims. The Act's criminal penalties included doubling sentencing at the federal level for sex crimes for repeat offenders, and perhaps most importantly, grants full faith and credit to orders of protection (court directives dictating that an abuser avoid contact with the victim), meaning that such an order issued in one state must be given force of law by another state if the victim has relocated there. Rape shield laws were also strengthened, making a victim's sexual behavior virtually inadmissible as evidence against them. Civil law protections speak to the responsibility of the perpetrator providing financial restitution to victims. The Act also attempted to allow victims of domestic violence to sue in federal court on the basis of gender discrimination. The United States Supreme Court, however, barred such suits *United States v. Morrison* (529 U.S. 598 (2000)), citing improper application of the Commerce Clause of the United States Constitution.

Other federal criminal penalties that relate to domestic violence can be found in the United States Code. Some of these provisions restrict possession of a firearm or ammunition by an alleged perpetrator while under an order of protection, or by a convicted abuser after conviction (18 U.S.C. § 922(g)(8-9)). Violence or attempted violence against an intimate partner (18 U.S.C. § 2261), and stalking using the mails or in cyberspace (18 U.S.C. § 2261A), and interstate violation of a protection order (18 U.S.C. § 2262). These crimes can carry penalties of up to life imprisonment in and of themselves depending on the type and severity of the offense. (United States Attorney's Office, North District of Georgia, 2015).

## State Provisions

The federal power to enforce laws concerning domestic violence is largely limited by the Commerce Clause of the United States Constitution to only those crimes that involve the crossing of state lines, such as with violation of orders of protection. However, state law provisions, while varying from jurisdiction to jurisdiction, are typically quite robust in providing criminal penalties for acts of domestic violence, including sex crimes, stalking, and elder abuse. Each state or jurisdiction below the level of the federal government has different, yet similar, laws in regard to domestic violence, with varying penalties for abusers and varying protections for victims.

For example, in the State of Tennessee, domestic violence laws begin with a description of domestic assault (Tenn. Code Ann. 39-13-111). This is defined as assault (described in Tenn. Code Ann. 39-13-101 as in-

entionally, knowingly, or recklessly causing bodily harm to another, putting the individual in reasonable fear of imminent bodily injury, or physical contact that would reasonably be viewed as extremely provocative or offensive), by persons who are or were married, cohabitating, sexual partners, whether by or against adults or minors. Penalties for such abuse generally involve fines of up to \$200.00 for assault, plus an additional fine of up to \$200.00 as a result of the domestic assault charge, the funds going to domestic violence education, prevention and assistance programs. In addition, the crime is considered a Class A misdemeanor, the most serious category of misdemeanor, with a potential penalty of up to eleven months and twenty-nine days in jail and a \$2,500.00 fine. A final provision of the domestic assault statute provides that convicted abusers must relinquish possession of firearms.

Orders of protection issued by Tennessee courts to alleged abusers carry additional penalties for violators. These violations submit the perpetrator to at least twelve hours in custody and potentially a fifty dollar fine for civil contempt. In addition, violation of an order of protection is a Class A misdemeanor, placing the violator in additional legal jeopardy in addition to other crimes that may have been committed (Tenn. Code Ann. 36-3-601, 624). Other crimes related to domestic violence are recognized by the State of Tennessee, such as stalking (Tenn. Code Ann. 39-17-315). In addition, if an abuser commits additional crimes such as robbery, rape, kidnapping or murder, these can, of course, be criminally pursued and punished in addition to charges specifically related to assault and domestic assault.

Numerous legal protections at both the state and federal level are available to punish domestic abusers and protect victims. The law is not without recognition of the presence and severity of such criminal activity. However, pursuing justice often requires the willingness of victims to report and cooperate with legal authorities. Such a matter is often complicated, especially when victims are dependent upon intrinsic and extrinsic support from their abusers. As this discussion continues, the particular vulnerability of individuals with disabilities to domestic abuse and their feelings of dependence are discussed in relation to the phenomenon of domestic violence.

## Applying Identified Definitions to Persons with Disabilities

Violence prospectively might also be ambiguous when applied to persons with disabilities. Managing anger that arises in a group home setting might be very different when viewed from the perspective of those with disabilities living in confined spaces with strangers. Well-meaning professionals, uneducated about how to assist without restraint might be misconstrued as



helpful instead of perpetrating violence. Hassouneh-Phillips, McNeff, Powers, and Curry (2005) and Nosek, Foley, Hughes, and Howland (2001) suggest that disability can tend to increase the potential for victimization through violence.

### Secondary Victimization

Individuals who are abused or victimized by another must live day-to-day, attempting to survive, and when or if they decide to report or acknowledge the abuse, they similarly may face secondary victimization. Further perpetuating secondary victimization for those with disabilities, includes the refusal to acknowledge identified actions as abuse. The unwillingness to identify neglect that leads to harmful outcomes, physical aggression in caring for those with disabilities, and limitation of food or medication as domestic violence, creates a treacherous landscape for understanding, reporting and gaining resolution. Secondary victimization prospectively creates the invisibility of most cases of domestic violence when the victim has a disability. When these individuals do come forward and report abuse or violence perpetrated to them, the attitudinal barriers pose further harm and victimization. It may be suggested that if an individual is considered helpless or child-like, their opinions are not valued and their needs are more easily brushed aside or foreclosed by another. Moreover, if an individual is considered by society as non-sexual, sexual abuse against them may be viewed as trivial or tangential. Finally, if individuals with disabilities are perceived as burdensome, fewer may report victimization out of fear that they will cause more burden to those that they depend on for daily needs. Abuse may potentially become commonplace, or a daily expectation for some persons with disabilities (Copel 2006). It may be suggested that combining the attitude of the victim and society has led to unidentified and misunderstood barriers when seeking solutions to both identified and unidentified abuse.

Domestic violence affects not only the abuse victim, but those close to them, including family, friends, and significant others (United States Department of Justice, Office on Violence Against Women, n.d.). When family members fulfil a caregiver role to an individual with a disability, the family member may feel it is their right to guide or dictate services. It may be proposed that an individual in this situation may find it necessary to allow for individual decisions be made, even if those decisions are harmful or neglectful. Over time, the normalcy or day-to-day routine may cause the individual with a disability to become passive or afraid to advocate for their rights or needs. In a similar situation, frayed tempers, exhaustion of caregivers, and isolation of the individuals with disabilities, may be proposed to lead to violence.

### Public and Private External Resources

Educating individuals about external governmental resources that can intervene, such as law enforcement and human services agencies, represents a daunting task, given the lack of understanding of both domestic violence and its many forms, and the circumstances of individuals with disabilities. Even though the Police Executive Research Forum (2015) reported that successful programs tend to reflect a cooperation between social service providers and law enforcement, there was no confirmation that disability was considered when making this statement. When common practices are considered in the context of persons with disabilities, identified best-practices may not give reach an individual with a disability in need, nor properly document findings to law enforcement responders.

There are several research-based findings that show current policies can actually inhibit effective interaction between law enforcement and domestic violence calls when responding to those with disabilities. First, the Police Executive Research Forum (2015) discusses the use of visible or audible signals such as lights or sirens when responding to a domestic violence call. Individuals with sensory disabilities such as autism may be overwhelmed, frightened or can completely shut down communicatively due to such extreme visual and auditory over-stimulation. This lack of ability to communicate may be perceived by uneducated law enforcement as unwillingness to cooperate or perhaps even a sign of intoxication or emotional instability, leading the interaction and investigation into misguided directions. A second common policy directing officers once on the scene is to separate the parties, according to the Police Executive Research Forum (2015). Establishing space between victims and their perpetrators may help victims speak freely in certain situations, but when disability is a factor, this may create even more challenges. If the perpetrator of the domestic violence situation is the interpreter for a victim who is deaf, for example, and responders do not have proper training in communication with deaf or hard of hearing individuals, barriers are created. If the victim has an intellectual disability, separation from those that typically are perceived in charge, even if that individual is the perpetrator, can prospectively add more fear and victimization to the individual with a disability.

Other policies can cause lasting added burden to the victim with a disability. As outlined by the Police Executive Research Forum (2015), a 72-hour no-contact order can be implemented. Individuals with disabilities rely on limited resources to meet daily needs. If the perpetrator is also fulfilling the role of care-taker, and they are blocked from returning home, needs of the individual with a disability will not be met, further perpetuating the victimization. Without proper

education and understanding by law enforcement that the needs of the individual with a disability will need to be met in another way, a much larger problem can occur. Further perpetuating this type of situation, brought on by well-intended policy, may be proposed to stem from the lack of education that the care-taker will need to possess.

Finally, one method outlined in policy by the Police Executive Research Forum (2015), is to interview neighbors. This seemingly simple way of gathering information can also lead to misinformation and instability in the investigation when documenting the lives of those with disabilities. Well-intentioned onlookers may feel they understand what they view over a fence, or while interacting during walking the dog, but without proper understanding of a disability, or what that disability limits or does not limit, the neighbors have very little actual understanding of what disability truly looks like. An individual with a physical disability may use a van service to get to work each day. The neighbors may report to investigators that the van service is merely taking the individual with a disability to another location. Neighbors may witness abuse, but identify it as helpfulness, such as a spouse never allowing an individual with a disability to leave the house for groceries or other household tasks. While these incidents seem small, as misinformation builds a case, an outcome of findings and reports to the courts may cause a perpetrator to be released without penalty of violence towards another, and as a result the abusive action may fail to be adjudicated by the court (Williams, 1995).

Overall, research by law enforcement, about law enforcement policy and procedure such as that documented by the Police Executive Research Forum (2015), indicates that domestic violence remains hidden, causing it to have less public awareness than other violent crimes. With limited understanding, lack of policy driven initiatives and little or no focus, domestic violence in the lives of those with disabilities constitutes secondary victimization in the realm of law enforcement.

Similar to law enforcement, human service agencies are governmentally funded resources for communities. As with law enforcement, there are policies and procedures that must be obeyed, and these are what organize the resource implementation to groups depending on hierarchy of perceived need. Human services agencies are thought of as primary resources for families in need. Large, general areas of focus can encompass food, shelter, language barriers, employment, transportation, and child and elder services. Statistics reported by Rosen (2006), found poverty rates of approximately 33% and 40% for working women with disabilities and working women with severe disabilities, respectively. These employed women with disabilities are the part of the population that

human service agencies are intended to serve, yet, here again, there is little noted about these areas of focus when it relates to those with disabilities. While interpreter services may be offered in a local department of human services office, and there are working elevators and stable ramps leading into the front door, very little education of employees is documented about the differences in service delivery and needs of those with disabilities.

When reviewing ineffective service delivery to women with disabilities, Chang et al (2003), found that problems with training, funding, and architectural or structural limitations created the greatest problems for persons with disabilities in seeking services. Lack of funding for an agency typically alters policy, so that limited funds can be used for maximum results. With little or no research or statistics kept for those with disabilities seeking services, the population of those with disabilities needing services never makes it to the maximum results list, compiling ineffective services with ineffective service delivery. Agency staff training about disability and how it relates to services continues to add barriers to the lives of individuals with disabilities.

Invisibility of disability affects the ability of human service agencies to lower the impact or incidence of domestic violence, if those being victimized are unable to access those services available from those agencies, whether or not such services are directly related to the matter of domestic violence. Rosen (2006) found that 60% of women of working age with disabilities were either unemployed or under-employed. This group of individuals seeking human services experience barriers in understanding what is expected of them to access services, such as individuals with learning disabilities being unable to complete basic forms to get an appointment or those needing interpreter services to set up the appointment not being able to access the information to gain these services. While the building itself may be up to code with relation to architectural advancements to assist those with physical disabilities when entering the building, the local human services department may be housed in an area that is not on a public bus line, or have outdated parking areas that do not have the space to accommodate wider vans or spacing for side ramps on vans. Each of these individual limitations leads to those with disabilities being unable to access necessary services. In turn, this inability to access basic human services, leads to those with disabilities remaining in situations that can and do lead to domestic violence. Lack of awareness in the community about disability, coupled with the inability of agencies to deal with financial issues of persons with disabilities and the failure of community agencies to provide adequate resources hinder the effect that community agencies have in assisting persons with disabilities who are victims of domestic violence (Hickson, Khemka, Golden, & Chatzistyli, 2013).



## Domestic Violence Organizations

Domestic violence organizations, similar to human services agencies, are prone to the same limitations concerning accessibility and training and staff education about disability and how it impacts the individuals seeking services. One major difference in domestic violence organizations, causing even more challenges for those with disabilities facing domestic violence, is funding. While human services agencies have limited resources, governmental implementation, federal dictate and state match give a more balanced funding stream than funds to nonprofit domestic violence organizations, often sustained through “soft money” sources such as grants and charitable donations. According to Pickert (2013) only about one-fifth of funds allocated to law enforcement were applied to finding transitional housing for victims of abuse. Allocation of these of limited funds for job training, counseling, housing and legal fees incurred by domestic violence organizations confound even the most balanced efforts. With estimates by 85% of women being victimized by abuse during their lifetime (Hassouneh-Phillips & Curry, 2002) it becomes understandable that funding allocation can be the greatest barrier to service delivery in domestic violence organizations.

Aside from funding concerns, understanding of the differences faced by those with disability living with domestic violence serves as another barrier to assistance from these organizations. Copel (2006) found that published studies tend to treat disability and abuse as separate issues. Those educated in disability rights, laws or counseling, those that live with disability and disability rights groups have one portion of the puzzle. Those that are educated, study, work in or have been affected by domestic violence have another portion of the puzzle. The inability to combine the two sides into a solid plan for resource delivery may leave individuals with disabilities who face domestic violence invisible in both arenas. Concepts outlined by Copel (2006), such as partners remarks devaluing the woman and addressing her as a disability rather than a person, victims feeling that their disability rendered them physically separate or inferior to other women, thereby giving the perpetrator the power to fail to acknowledge or express remorse that abuse of his partner was wrong, and that the treatment of the woman with disabilities as subhuman, working to further compound the woman’s sense of shame, guilt, and confusion, and contributes to her questioning “what she did” to incur the violence. Organizations intended to serve those facing domestic violence may have a limited concept of those living with both disability and domestic violence or the forms of learned helplessness, fear of retribution, or silence that most carry with them.

Because of the vulnerability and highly dependent nature of women with disabilities, they rarely complain or voice anger and humiliation according to Brodwin and Siu, (2007), Women with disabilities reported by

Copel (2006), ignore, rationalize, and endure the abuse for the sake of survival, rather than to preserve their dreams of romantic love. For women with disabilities, Nosek, Howland and Young (1997) reported that husbands or live-in partners were the most common perpetrators of physical and emotional abuse.

Organizations serving those affected by domestic violence do not have the understanding of the components that make up a day in the life of individuals with disabilities. Abuse can be rendered in many facets that, if not taken into consideration, leave gaps in the ability to provide structured services that will allow for consistency in the future success of those victimized. Such examples of disability-related intimate Partner Violence given by Powers et al. (2002) include medication manipulation, refusal to provide assistance with essential activities of daily living, denial of access to telephones and other communication devices, and destruction of adaptive equipment. Withholding of medication and other access to basic needs can be life threatening and used to terrorize the individual with a disability. Damaging or removing expensive adaptive aids can create barriers in communication, mobility and be hard to replace. When these differences aren’t taken into consideration as individuals with disabilities meet with domestic violence organizations, comprehensive goals are not met. Current research does not include intake questions that might indicate such abuse is occurring, and individuals themselves in crisis, may not remember or even realize that this form of domestic manipulation is happening or abusive in nature.

A trend in recent years has been to combine all needed services, law enforcement, legal, counseling and other such needs of those facing domestic violence, into family justice centers. As reported by the Police Executive Research Forum (2015, one Maryland county law enforcement agency had over fifty personnel dedicated to domestic violence investigation, adjudication, and assistance. While this may be comprehensive for those facing domestic violence in the general population, resources specific to individuals with disabilities are not specified. Research does not indicate a background in training or education that would give the professionals an understanding of disability. Likewise, when services such as temporary housing shelters are secured, availability of location and needed space are the only considerations. Local public transportation to the shelter, architectural barriers to enter the shelter and access restrooms, showers and other necessities, 24-hour interpreter services, on-site communication devices and informed staff are not secured by such limited funding.

## Disability Organizations

With the major focus of the disability rights movement being equal rights and equal opportunities for individuals with disabilities, most disability-specific organizations center goals and plans around this same philosophy. Those in the disability community have learned from history that organizing groups of like-minded individuals, compiling resources and gathering momentum, creates change. Disability focused organizations are similar in scope to other organizations, maintaining a membership that plans and implements action in a directed way. While organizations intending to research and eliminate disability barriers create positive change for the specified disability group, few such organizations have a disability and domestic violence specific component.

American Disabled for Attendant Programs Today (ADAPT), was founded in 1978 and primarily serves individuals with physical disabilities. The American Council of the Blind (ACB) was founded in 1961 and has been at the forefront of the creation of policies that have shaped the opportunities that are now available to people who are blind. The National Association of the Deaf, founded in 1880, is a civil rights organization of, by and for deaf and hard of hearing individuals. The Arc of the United States, is a national organization serving people with intellectual and developmental disabilities. None of the internet home pages for these organizations included information about individuals in the designated population facing domestic violence. Even with hundreds of dedicated organizations focusing on disability, there is very little attention given to domestic violence and disability. Within the disability world, the invisibility of domestic violence is just as prevalent as in other research findings.

## Conclusions

Research clearly delineates a gap between domestic violence policy and outcomes in regard to the specific needs of individuals facing domestic violence who have a disability. Shifting definitions of disability, and care-taker and community living, make understanding of the specific issues faced by these individuals more difficult. Domestic violence organizations and advocates do not appear, for the most part, to have skills and knowledge of the needs of those living with a disability. When definitions intended as a one-size-fits-all solution is applied to those with disabilities, the outcome is disastrous.

The secondary victimization in the lives of individuals with disabilities facing domestic violence is an unfortunate result of this lack of understanding. When reading books and articles intended to combine the two topics, most focused on chapters dedicated to one or the other,

and no clear combination is accomplished. This lack of a connection allows the reader to make an educated guess at best practices, from knowledge gained from comparing the two sections. Victims with disabilities themselves are unable or unwilling to report such victimization, adding a further secondary victimization component to an already invisible problem faced by communities including those with disabilities. External governmental agencies lack funding, education and training to create a comprehensive crisis response for individuals with disabilities. When attempting to use policy intended for general populations, such as for law enforcement response or completion of documentation at human service agencies, the outcome can be just as detrimental as the situation in need of resource. Even though funding is being utilized for governmental entities, the complex needs and training to meet these needs is not found in the research currently being conducted and those with disabilities are left out. Nonprofit domestic violence centers and disability specific organizations are focused on a dedicated topic. This topic remains the singular direction of any funding or push for policy change, and does not effectively combine domestic violence and disability as a complete issue.

The inability to create a clear picture of domestic violence and the role disability plays in it, with definitions that cross current understanding, fear of retribution by those with disability living in crisis, attitudinal and architectural barriers, emotion and fear, funding constraints, governmental policy that lacks of training and education, have all led to the invisibility of those with disability who face domestic violence. With no clear research and no direction to proceed, it is as though there is a tacit acknowledgement that those with disabilities do not face domestic violence. Until there is acknowledgement of the special needs of victims and the resources and willingness to integrate these special needs into the understanding of phenomenon of domestic violence, victims will continue to find great difficulty in seeking or finding solutions.

## References

- American Council of the Blind. (n.d.). Home page. Retrieved October 13, 2015, from website: <http://acb.org/about>
- American Disabled for Attendant Programs Today. (n.d.). Home page. Retrieved October 13, 2015, from website: <http://www.adapt.org/>
- Brodwin, M. G., & Siu, F. W. (2007). Domestic violence against women who have disabilities: What educators need to know. *Education, 127*(4), 548–551.
- Chang, J. C., Martin, S. L., Moracco, K. E., Dull, L., Scandlin, D., Loucks-Sorrel, M. B., Turner, T., Starsonck, L., Dorian, P. N., & Bou-Saada, L. (2003). Helping women with disabilities and domestic violence: Strategies, limitations, and challenges

- of domestic violence programs and services. *Journal of Women's Health*, 27(7), 699–708.
- Copel, L. (2006). Partner abuse in physically disabled women: a proposed model for understanding intimate partner violence. *Perspectives in Psychiatric Care*, 42(2), 114–129.
- Hassouneh-Phillips, D., & Curry, M. A. (2002). Abuse of women with disabilities: State of the science. *Rehabilitation Counseling Bulletin*, 45(2), 96–104, 105.
- Hassouneh-Phillips, D., McNeff, E., Powers, L., & Curry, M. A. (2005). Invalidation: A central process underlying maltreatment of women with disabilities. *Women & Health*, 41(1), 33–50.
- Hickson, L., Khemka, I., Golden, H., & Chatzistyli, A. (2013). Views and values of developmental disabilities and domestic violence/sexual assault support professionals regarding the prevention and handling of situations of abuse. *Journal of Policy & Practice in Intellectual Disabilities*, 10(3), 207–214.
- Hughes, R. B., Lund, E. M., Gabrielli, J., Powers, L. E., & Curry, M. A. (2011). Prevalence of interpersonal violence against community-living adults with disabilities: A literature review. *Rehabilitation Psychology*, 56(4), 302–319.
- Jones, A. (2000). *Next time, she'll be dead: Battering & how to stop it*. Boston, MA: Beacon Press.
- Lewin, B. (2007). Who cares about disabled victims of crime? Barriers and facilitators for redress. *Journal of Policy & Practice in Intellectual Disabilities*, 4(3), 170–176.
- National Association of the Deaf. (n.d.). Home page. Retrieved October 13, 2015, from website: <https://nad.org>
- Nosek, M. A., Foley, C. C., Hughes, R. B., & Howland, C. A. (2001). Vulnerabilities for abuse among women with disabilities. *Sexuality and Disability*, 19(3), 177–189.
- Nosek, M.A., Howland, C. A., & Young, M. E. (1997). Abuse of women with disabilities: Policy Implications. *Journal of Disability Policy Studies*, 8(1-2), 157–175.
- Pickert, K. (2013). What's wrong with the Violence Against Women Act? Retrieved November 2, 2015 from <http://nation.time.com/2013/02/27/whats-wrong-with-the-violence-against-women-act/>
- Police Executive Research Forum (2015). Police improve response to domestic violence, But abuse often remains the 'hidden crime'. Police Executive Research Forum Newsletter, 29(1), 1–11.
- Powers, L. E., Curry, M. A., Oschwald, M., Maley, S., Saxton, M., & Eckels, K. (2002). Barriers and strategies in addressing abuse: A survey of disabled women's experiences. *Journal of Rehabilitation*, 68, 4–13.
- Rosen, D. B. (2006). Violence and exploitation against women and girls with disability. *Annals of The New York Academy of Sciences*, 1087(1), 170–177. doi:10.1196/annals.1385.002
- The Arc of the United States. (n.d.). Home page. Retrieved October 13, 2015, from <http://www.thearc.org>
- United States Attorney's Office, North District of Georgia (2015). *Federal domestic violence*. Retrieved June 29, 2016. Website: <https://www.justice.gov/usao-ndga/victim-witness-assistance/federal-domestic-violence>
- The United States Department of Justice, Office on Violence Against Women. (n.d.). What is Domestic Violence? Retrieved October 19, 2015. from [www.justice.gov/ovw/domestic-violence](http://www.justice.gov/ovw/domestic-violence)

# Psychometric Protocols for Psychological, Educational, and Vocational Testing for Persons with Blindness and Visual Impairments

Theodore Scott Smith and Charles E. Taylor

Psychological, educational, and vocational testing is rarely accommodated or modified for persons with blindness or visual impairments. Reasons for failing to modify testing may include lack of knowledge about the need to modify testing by the test administrator, poor current testing options for this specialized population, and lack of skills to offer appropriate accommodations. In addition to addressing these issues, this article offers a historical framework for testing persons with blindness and visual impairments, necessary traits to be tested, qualifications of persons completing testing, proposed purposes of these evaluations, and then recommendations for further testing development.

*Keywords:* blindness, visual impairment, psychometric, psychological testing

Across the United States, and indeed internationally, specified efforts are taken to educate, train, and increase independent living skills for persons with blindness and visual impairment. However, adequate testing remains an arduous issue, leaving the Psychologist, Rehabilitation Counselor, or other providers few testing options. Historically, prior, vital initiatives have been taken to advance psychometric protocols for persons with blindness and visual impairment; however, many of these efforts have been paused since the mid-1990s. Potential reasons for the difficulty related to testing this population may be related to lack of knowledge about the need to modify the testing protocol, poor updated current test options for this population, and lack of skills by individual providers to offer appropriate accommodations. As such, this monograph addresses this timely topic. This article will furthermore offer recommendations for further psychometric development to promote vocational placement, educational planning, and independent living skills considerations for this population.

## Lack of Professional Knowledge about Need to Modify Testing Protocols

Admittedly, persons completing testing for persons with blindness and visual impairment vary greatly regarding their specific skills and abilities completing

this specialized testing. Some professionals may have great knowledge about testing modifications and needed considerations, which others may simply seek minimal guidance and accept minimal foresight regarding testing modifications. The lack of knowledge may be facilitated by the reality that most probably this population remains a small proportion of a provider's caseload. Or, specialization in knowledge regarding this population may not be financially feasible or profitable by an individual provider. Among the range of tests offered for a generalized rehabilitation population, counselors may similarly be unfamiliar with the tests specialized (i.e., CVES) or modifiable for these persons (i.e., Wide Range Achievement Test). Complicating the lack of knowledge argument, one must consider that blindness or visual impairment often accompanies another disability, injury, or physical impairment, such as head injury, stroke, or diabetes. As such, upon referral, visual impairments may be listed as complimentary disabilities, limiting initial assessment or need for special testing. Moreover, considering the potential for multiple diagnoses, the evaluator must consider the need for prospectively cognitive, physical, and also specialize testing pertaining specifically to vision.



## Poor Current Test Options for Specialized Population

Three test options are currently available, with some more and others less preferable than others. First, individuals may utilize generalized testing materials or protocols without accommodations. In this circumstance, current testing materials are used "as is" and not modified. A positive feature of this approach is that ecological validity is assured, considering the materials are not modified and indeed reflective of an everyday environment. A negative feature entails that the referenced norm is not for persons with blindness or visual impairment, perhaps underestimating a person's ability. A second option is utilizing existing testing with accommodations. Accommodations may include reading testing materials aloud that are traditionally read by the person completing the test, enlarged print, or simple exclusion of materials that cannot be utilized by this specialized population. This method again allows the utilization of materials with a broad normed base, but standardization with materials is breached, perhaps limiting generalizability or even interpretation with the original norming group. Lastly, specialized testing for this population may be used, such as the CVES. A benefit of this testing entails use of specialized materials that are visual free, but a disadvantage is the realization that these materials have a limited norming group and the timeliness of the norming time range, with published norming is limited.

### Lack of Skills to Offer Accommodations

As few testing options may be available, there may similarly be few test providers with specialized skills. A foundation for this inadequacy may be poor knowledge about blindness by an individual provider. This lack of specialized knowledge may be linked to both the wide reasons related to congenital blindness and blindness acquired across the lifespan. Furthermore, degrees of blindness vary greatly, ranging from complete loss of blindness to variable degrees of acuity and ability to see shades, light, and generalized forms. It is also proposed that lack of skills by many providers may be due to poor funding for specialized training to gain knowledge and skills to test this population by individual providers.

### Historical Framework

When addressing the historical framework for testing persons with blindness and visual impairments, one must definitively begin with the history of rehabilitation itself. Unfortunately, and with reality, wars result in physical and psychological trauma for individuals. As a result of this trauma, soldiers return with the need for rehabilitation, including physical and cognitive rehabilitation. After both World War I and II

soldiers returned with the need to attain rehabilitation to both increase their activities of daily living skills and also improve vocational marketability. As a result of these needs, federal and state governments offered training and financial resources to improve quality of life for these returning soldiers. Going into the 1960s, there began a push towards individual advocacy and appreciation for individual contributions to society. While perhaps persons with disabilities were discounted or the advocacy efforts waned in the 1950s these efforts were reinitiated or invented during this decade. With this decade efforts were taken for inclusion, as opposed to exclusion for persons with disabilities. In the 1990's with the advent of the Americans with Disabilities Act public sentiment again began to consider both opportunity and loss of opportunity for persons with disabilities. As the ADA began, so did lawsuits and also concern about whether the ADA would advance or thwart efforts for persons with disabilities to become incorporated into societal frameworks.

## Testing Purposes

The purpose of test administration will vary based on the client taking the test. Range of utility for specialized assessment may also vary in relation to the skills of the test administrator. This section will address the potential utility of specialized testing for persons with blindness and visual impairment. Moreover, it is proposed that specialized efforts be taken to develop testing mechanisms for this specialized population, as opposed to simply modifying present testing not normed for this usage.

### Educational Planning

One proposed use of specialized testing will be to assist with educational planning. This may include assisting in determining placement of individuals in a new school setting, such as Kindergarten, or even vocational technical placement. The tool may also be valuable in evaluating a continuation of placement, such as when determining an educational course of action if a student is performing poorly. This may also be useful if reduction of placement is needed, such as someone being placed in a lower grade than one may be currently enrolled. Alternative placement, such as changing schools from a traditional education format to a charter or magnet school, may also represent another use of this test.

### Vocational Placement

Specialized testing may also serve a purpose regarding vocational placement. Transitional planning represents a valuable feature of vocational rehabilitation during the high school years. This assists in evaluating how



high school students with disabilities may successfully transition into the workforce. Vocational-technical or collegiate placement may also be valuable avenues of use for the test. High school classes traditionally focus on theory and non-applied academics. Utilizing the test could assist with identifying physical-cognitive interactions in a vocational-specific job placement. Unfortunately, many individuals may not benefit from their current placement and may need alternative placement. This test may assist in determining whether someone should maintain their current placement or pursue alternative placement.

### **Independent Living**

As one ages, or as one loses functioning, the ability to successfully interact effectively within one's environment lessens. The question therefore remains whether someone should leave their environment or if modifications could be made within their environment to increase this effective environmental interaction. It may be possible for someone to stay in their current living situation with aides. However, determining if someone is able to live without the continuous use of aides will be vital towards making these decisions. A test examining physical and cognitive dimensions for someone with blindness or visual impairment could prove useful in measuring independent living capabilities. Another alternative to remaining in their current situation may be the use of supervised living within an apartment complex or group housing. In these environments, persons must still perform activities of daily living, which an assessment can assist in deciphering if this may or may not be accomplishable with one's current set of skills. Alternatively, institutional care may be considered. Within institutional care, further consideration must be taken regarding independent living allowances versus circumstances wherein continuous monitoring is needed.

### **Psychological Testing**

Admittedly, few differences may be identified between psychological testing and the prior listing of potential uses. Psychological testing is used, from a basic stance, to evaluate human behavior, meeting criteria outlined previously. Within this dimension, this testing may be used to accompany additional intelligence, competency, or other testing efforts. Along this framework, it would be recommended that this testing not reach or be applied beyond its intended purpose or norming sample. Importantly, this test must complement, not replace other psychological tests.

### **Administrator Qualifications**

The ultimate purpose of testing will be to assist family members, professionals, and others to make decisions regarding persons with blindness and visual impair-

ments. While the test may be far reaching regarding both persons capable of administering it and others participating in its development and use, it must solely be marketed for its application, as opposed to strictly financial gain. For anyone administering the test a minimum knowledge base will be necessary. Persons must not only understand blindness and visual impairment, but also psychometrics. It may be proposed that qualification levels be separated by inherit skills and qualifications of potential administrators. Also, it is recommended that competency levels be designated by previous education, training, and number of tests completed.

When choosing allowed evaluators, it will be imperative to measure the skills of the evaluator to those needed for successful administering of the test. All evaluators must be culturally sensitive regarding race and sexual identity, among others, including vision culture. While blindness represents a sensory deficit, most often it concurrently represents definitive cognitive deficits. As such, the evaluator must be aware of how cognitive deficits affect independent living and social interactions, as well as sensory deficits. Similarly, due to nature of sensory disability, persons with blindness and visual impairments may incur social deficits, limiting their ability to interact with others. Limited social abilities may affect their ability to offer a true sample of behavior during testing, warranting special skills on behalf of the evaluator. Indeed, the number of professional, technical, and additional skills of the evaluator may be not definitive, or perhaps unlimited. Standards, such as those set forth through the American Psychological Association and other agencies, must therefore be upheld regarding tester qualifications.

### **Future Directions**

#### ***Accomplishments of Cognitive Test for Blind and Comprehensive Vocational Evaluation System Must be Acknowledged***

There are several accomplishments resulting from the development of the *Cognitive Test for the Blind* and the *Comprehensive Vocational Evaluation System*. These assessments were brought to fruition ahead of their time in the context of concurrent assessments. McCarron-Dial spent great efforts to realize this goal not only financially, but also with their allowance of time to develop such tests. The unveiling of these assessments and their contributions were pivotal points within the field of psychometrics, especially regarding the blind and visually impaired population. It allowed for the advancement of special interests in these areas. Additionally, an initial model was resultantly offered as a building block for future research. This enabled future researchers to save valuable time,

funding, and energy by not having to start without a model for guidance, but rather offered a pivotal starting point to develop further protocols. Any further developments in specialized testing must acknowledge the contributions of these leaders and perhaps even build upon their conventions.

### **Expand Potential Utility**

Specialized testing for persons with blindness and visual impairments have traditionally been utilized as tools for assisting with vocational placement. While vocational testing is definitively needed as the primary focus with such assessments, there are certain needs of individuals with blindness or poor vision that are beyond the scope of these assessments in job placement. These individuals, by nature of both employability and disability, must consider educational planning and also independent living accommodations in order to be successful. However, a broader focus will mandate expansion of areas covered by such tests to include cognitive and physical abilities, vocational interests, and other constructs.

### **Solicitation of Feedback from Blind and Visually Impaired Community**

In order to truly be successful in serving this population through development of testing protocols, the complete development process must be consumer driven. A matching to consumer needs must exist between psychometric protocols and ultimate usefulness for a specialized population. This can be accomplished via feedback from the blind and visually impaired community. It is still recognized, however, that such a test may be used by other populations, such as individuals with head injury or stroke, in which vision does not represent a primary diagnosis. These cross-disciplinary evaluations are probable, but must be used with caution, especially if there are limited norming samples.

### **Establish a Test Development Timeframe**

Essentially, the concept that “Rome was not built in a day” applies to these developments. Any venture of developing an assessment specialized for persons with blindness and visual impairment will represent a decade-long involvement and dedication to assure completion. It is predicted that many models will be developed and modified across time in order to account for consumer feedback, ease of use, changes in available technology, labor market conditions, etc. Grants will be needed to pursue this project, and consumers will be warranted to evaluate ecological validity. These venues must be evaluated every 2 years and then a long term, 10-year-framework must be developed for long term planning of such an instrument’s launch.

### **Incorporate Physical Capacities into Testing Protocols**

Linking this type of assessment to only intelligence and other cognitive features will limit the utility of the test. The development must include the examination of reaction time, alongside both upper and lower extremity strength, range of motion, and dexterity. Although, this will not be parallel to a Functional Capacity Evaluation. It is noted that while incorporating physical aspect into assessments, an evaluator must achieve balance between the assessment of physical capacities and the avoidance of injury.

### **Carefully Limit, but Concurrently Expand upon Allowance of Those Administering the Test**

While the test may be developed by doctoral-level initiators, including fields of psychology and engineering, it is most probable that the actual evaluators will possess a Bachelor or Master’s level of preparation. This will result in a wide and varying range of knowledge and also testing skills. Although individuals assisting with the development will be diverse, it is assured that there will be a need of basic competencies of evaluators to be demonstrated. Across all evaluators, there must be basic knowledge about blindness, human development, and psychometrics.

### **Test Affordability**

A personal critique of the present available testing materials is that only a select few can afford payment for them due to pricing, which limits their use in the broader community. Balance must be achieved across the cost of producing and developing test, financial resources, and potential profitability by both test developers and those utilizing the test. Within the costs accounted for, there must be a contingency related to certifying users of the test and continued competencies regarding modification of the tests in order to ensure proper administration and application.

### **Psychometric Progression Regarding Knowledge of Blindness and Visual Impairment**

The acquisition of knowledge about vision and vision impairment is dynamic and an ongoing learning process, rather than static. This knowledge is made available and facilitated by neuroimaging and also quick dissemination of information. Technology is expected to advance in the future years, particularly regarding Assistive Technology, which will affect the level of adaptability to the community for individuals with vision impairments. Financial resources for testing, as well as accommodations are expected to vary across time and from person to person, as seen in the past.

Surgical advancements may also enable adaptations and increases in functionality for individuals. Changes must be made to testing materials in order to accommodate and meet these ongoing realities.

### Timely Test Updates

A new test with traits as outlined previously will offer a more heuristic approach, adding value to the community. The population community must be advised regarding when updates may be expected to any testing advancements. Additionally, trainings and test modifications must be included in any testing updates. It is potentially recommended that updates be publicly disseminated at the 2, 5, 7 and 10 year follow-ups, but may be modified based upon needs of both the community and the test developers.

### Alpha and Beta Testing

In this context, differentiation must be made between both the alpha and beta testing. Alpha testing represents a form of acceptance testing by the developers. This is used to identify potential shortcomings or issues that must be resolved prior to formally issuing the test. Alpha testing should be done with both clinical and non-clinical samples, and moreover, in a lab, under supervision by a qualified developer to initiate needed changes based on results. Beta testing refers to the use of the test by real users, or persons, who will formally use the test for its intended purpose. In beta testing, the test will be administered to a limited number of persons, in order for the developers to obtain feedback quickly. This will prevent both failure of the product launch and also reduced risk for applications. After beta testing is completed, the product may be disseminated to the general public.

### Physical-Cognitive Interface for Persons with Blindness and Visual Impairment

Past testing has most often focused on single features, rather than addressed both the physical and cognitive features of test takers. Methods to evaluate these interfaces have not been identified or developed by the current authors. These interfaces will affect how persons with impaired vision will interact with their environment. This represents the most difficult experimental feature of testing development to achieve.

### Computer Advances and Testing Protocol

The standard of bringing large binders or briefcases to complete testing is an outdated concept, as we progress further with today's technological advances. For convenience, relevance, and functionality, today's testing must incorporate Internet databases for updated norms. Additionally, online manuals will decrease costs and allow consistent updates with limited

additional costs for those using the tests. Although, there will still be a need for physical interfaces, such as those used with haptic assessments. As a long term development, the use of telemedicine and electronic communication to complete testing may even be considered.

### Development of the Sensory Motor and Reaction Time Test, or C-Smart

At present the current authors are developing a test designed to address the specialized, aforementioned needs. Specifically, we are developing a test, deemed the Cognitive Sensory Motor and Reaction Time test, which will offer a series of vision-free, or vision reduced testing which will enable a variety of individuals to evaluate mental, physical, and social readiness for persons with blindness and visual impairment regarding job placement, independent living assignment, and also educational engagement. The first author, Dr. Scott Smith, has a background in both educational psychology and rehabilitation counseling, while the second author, Dr. Charles Taylor, has a background in mechanical engineering. Both of the authors are employed at the University of Louisiana at Lafayette, and they are in the process of not only norming the test, but also attaining federal funding for development of the test itself.

The C-Smart within its format will pull many features from current testing protocols, which are typified of current tests, such as *Cognitive Test for the Blind*, *Wide Range Achievement Test*, and also the past *Woodcock Johnson Brief Achievement Test* and *Woodcock Johnson Cognitive Achievement Test*. Within these tests, not only are features replicated, but also assessment of select features have been typified across numerous tests across the last century, such as digit forward, digit backward, reading comprehension, vocabulary, pair cancellation, and assessment of reaction time.

The SMART protocol will be based on the O\*NET (Occupational Network) criteria for establishing employability or placeability for individuals into the workforce. Again, the purpose of this testing protocol will be to evaluate real-skills needed to be placed in the workforce, participate in education, or evaluation of living placement. It is proposed within this Network that adaptability to work is based on the following: tasks performed, tools and technology, knowledge, skills, abilities, work activities, work context, education, interests, work styles, and then work values. Many of features are based primarily on cognitive or personality features, such as knowledge, interests, and work values. Others are based on work-specific components: tasks performed, work activities, and work context. Moreover, two components are not only psychophysical, but moreover measureable and quan-



tifiable: skills and abilities. These features are additionally applicable to independent living.

The skill assessment will fall into seven areas:

- **Coordination:** modifying one's own actions in relation to other's actions
- **Monitoring:** monitoring and assessing one's own performance, the performance of others, and also organizational behaviors in order to complete tasks
- **Quality Control Analysis:** conducting tests, alongside inspection of products or services
- **Active Listening:** attending to what others are saying, taking time to understand information, no interrupting, and correctly evaluating when to continue listening and also properly leave
- **Critical Thinking:** use both logic and reasoning to identify both strengths and weaknesses to not only solutions, but also conclusions and then actual approaches to problems
- **Speaking:** talking to others to present information efficiently and effectively
- **Time Management:** Managing both one's own time and evaluating time allotment by others

Moreover, the abilities assessment will fall into 12 areas:

- **Manual Dexterity:** the ability to move individual hands, and hands in concert; grasp objects; perform both fine and gross motor movements
- **Finger Dexterity:** differs from Manual Dexterity in focus of fingers, as opposed to whole upper extremity; includes the ability to grasp, manipulate, and also assemble small objects
- **Problem Sensitivity:** the ability to identify not only when a problem is correctly solved, but also when something wrong occurs; this differs from solving a problem and instead focuses on simply identifying when a problem does occur
- **Near Vision:** the ability to see details within a few feet
- **Oral Comprehension:** the ability to both listen to information and respond to information received
- **Arm-Hand Steadiness:** the ability to keep both hand and arm steady, while moving hand or arm in one position
- **Deductive Reasoning:** ability to apply general rules to specific problems, which can be both physical or cognitive based
- **Information Ordering:** ability to arrange objects or actions in a specified order or pattern
- **Control Precision:** ability to both quickly and repeatedly the controls of a machine to precise or exact positions

- **Oral Expression:** ability to communicate information and ideas through speaking so others will understand spoken expression
- **Speech Recognition:** ability to both identify and understand the speech of another person
- **Written Comprehension:** ability to read and understand information and ideas presented in writing

While considering "what" will be measured, one must consider the reality that visual impairments are very diverse. Blindness and visual impairments may be the result of birth-related problems, stroke, progressive congenital conditions, or accidents, among others. Visual abilities may diverge, ranging from minor loss of visual acuity, wide to restrictive peripheral vision, to complete loss of vision. Functional work abilities may range from the ability to work independently, with supervision, or perhaps unable to work with or without coaching or supervision. Lastly, independent living skills may diverge, ranging from the ability to live independent, live with limited supervision, to institutionalization. As skills and abilities range widely across persons with blindness and visual impairment, any assessment must not only be modifiable for those with great and poor skills, possess great predictive validity, potentially transportable, and then affordable.

It is predicted that this test will become active or publishable between 18 to 24 months. Beyond the allocated 24 months, it is further assessed that an additional two years will be needed to beta test the testing protocols. This monograph offers the initial introduction of this initiative.

## Conclusions

The *Zeitgeist* is proper to further consider testing modifications for persons with blindness and visual impairment. Modern technology has enabled persons with blindness and visual impairment to expand not only access to assistive technology, but also career options utilizing technology. Due to these advancements, alongside the availability of funding to evaluate placement options for persons with blindness and visual impairment, Counselors, Psychologists, Engineers and others must advance their knowledge about testing protocols for this specialized population. During this maturation stage, professionals must recognize the diversity of skills and abilities among those with these disabilities, acknowledge the limitations of current testing protocols, seek feedback from the blind and visually impaired community, and then distinguish the need for protocol modifications to meet client needs.

Table 1. Psychomotor Features Affecting Vocational Placement, Education, and Independent Living

|                      |  |
|----------------------|--|
| Sensory              | <p>Quality Control: Identify correct and incorrect features of daily objects</p> <p>Near Vision: Evaluation of functional vision, based on both medical records and also measurement of close vision</p> <p>Deductive Reasoning: Complete finger taps to coordinate with auditory cues</p> <p>Control Precision: Complete finger taps to coordinate with auditory cues</p>   |
| Motor                | <p>Manual Dexterity: Identify strength and range of motion</p> <p>Finger Dexterity: Completion of fine motor task to complete work related behaviors</p> <p>Arm-Hand Steadiness: Evaluation of steadiness at below waist, waist, and above waist tasks</p> <p>Information Ordering: Haptic identification of order, quadrant and member</p>  |
| Reaction Time        | <p>Problem Sensitivity: Identify correct and incorrect solutions in a basic assembly task, with measurement of time</p> <p>Oral Expression:</p>  |
| Cognitive Processing | <p>Time Management: Completion of an set task to a specific period of time</p> <p>Monitoring: Evaluate quantitative completion of a set task</p> <p>Active listening: Complete digit-forward and digit-backward memory task</p> <p>Critical Thinking: Complete reading comprehension task</p> <p>Speaking: Present verbal responses to linguistic and mathematical problems</p> <p>Time Management: Predict self and other times to complete an assigned task</p> <p>Oral Comprehension: Respond to simple and complex demands for both manual and critical thinking tasks.</p> <p>Speech Recognition:</p> |

### Recommended Readings

- Arslantekin, B. A. (2015). The evaluation of visually impaired students' mobility skills. *Education and Science, 40*(180), 37–49. Available at <http://dx.doi.org/10.15390/EB.2015.4184>
- Capella-McDonnall, M. E. (2005). Predictors of competitive employment for blind and visually impaired consumers of vocational rehabilitation services. *Journal of Visual Impairment & Blindness, 99*(5), 303.
- Cavanaugh, B. S., Giesen, J. M., & Steinman, B. A. (2006). Contextual effects of race or ethnicity on acceptance for vocational rehabilitation of consumers who are legally blind. *Journal of Visual Impairment & Blindness, 100*(7), 425.
- Carvill, S. (2001). Sensory impairments, intellectual disability and psychiatry. *Journal of Intellectual Disability Research, 45*(6), 467–483.
- Corn, A. L. (1995). *The national agenda for the education of children and youths with visual impairments, including those with multiple disabilities*. New York, NY: AFB Press, American Foundation for the Blind.
- Darensbourg, B. L. (2013). Predictors of competitive employment of VR consumers with blindness or visual impairments. *Journal of Vocational Rehabilitation, 38*(1), 29–34.
- Fenwick, E. K., Ong, P. G., Man, R. E., Cheng, C., Sabanayagam, C., Wong, T. Y., & Lamoureux, E. L. (2016). Association of vision impairment and major eye diseases with mobility and independence in a Chinese population. *JAMA Ophthalmology, 134*(10), 1087–1093.
- Gross, A. M. (1979). Preventing institutionalization of elderly blind persons. *Journal of Visual Impairment and Blindness, 73*(2), 49–53.
- Guise, B., Thompson, M., Greve, K., Bianchini, K., & West, L. (2012). Assessment of performance validity in the Stroop Color and Word Test in mild traumatic brain injury patients: A criterion-groups validation design. *Journal of Neuropsychology, 8*(1), 20–33.
- Hill-Briggs, F., Dial, J. G., Morere, D. A., & Joyce, A. (2007). Neuropsychological assessment of per-



- sons with physical disability, visual impairment or blindness, and hearing impairment or deafness. *Archives of Clinical Neuropsychology*, 22389-404. doi:10.1016/j.acn.2007.01.013
- Hirose, Y., Itao, K., & Umeda, T. (2012). Generating a new interview method by using sensing technology to assess human emotions. *Electronic Journal of Business Research Methods*, 10(2), 110–120.
- Kuyk, T., Liu, L., Elliott, J. L., Grubbs, H. E., Owsley, C., McGwin, & . . . Fuhr, P. S. (2008). Health-Related quality of life following blind rehabilitation. *Quality of Life Research*, 17(4), 497.
- LaPolice, C., Carter, G. W., & Johnson, J. W. (2008). Linking ONET descriptors to occupational literacy requirements using job component validation. *Personnel Psychology*, 61(2), 405–441. doi:10.1111/j.1744-6570.2008.00118.x
- Miller, J. C., & Skillman, G. D. (2003). Assessors' satisfaction with measures of cognitive ability applied to persons with visual impairments. *Journal of Visual Impairment & Blindness*, 97(12), 769–774.
- Most, T., & Greenbank, A. (2000). Auditory, visual, and auditory-visual perception of emotions by adolescents with and without learning disabilities, and their relationship to social skills. *Learning Disabilities Research & Practice*, 15(4), 171–178.
- Nelson, P., Dial, J., & Joyce, A. (n.d). Validation of the Cognitive Test for the Blind as an assessment of intellectual functioning. *Rehabilitation Psychology*, 47(2), 184–193.
- Ostrowski, C. P. (2016). Improving access to accommodations: Reducing political and institutional barriers for Canadian postsecondary students with visual impairments. *Journal of Visual Impairment & Blindness*, 110(1), 15–25.
- Salive, M. E., Guralnik, J., Christen, W., Glynn, R. J., Colsher, P., & Ostfeld, A. M. (1992). Functional blindness and visual impairment in older adults from three communities. *Ophthalmology*, 99(12), 1840–1847.
- Sall, N., & Mar, H. (1999). In the community of a classroom: inclusive education of a student with deaf-blindness. *Journal of Visual Impairment & Blindness*, 93(4), 197–210.
- Sgobbi, F., & Suleman, F. (2015). The value of transferable skills. *Scottish Journal of Political Economy*, 62(4), 378–399. doi:10.1111/sjpe.12079
- Stuss, D. T., Stethem, L. L., Hugenholtz, H., Picton, T., Pivik, J., & Richard, M. T. (1989). Reaction time after head injury: Fatigue, divided and focused attention, and consistency of performance. *Journal of Neurology, Neurosurgery & Psychiatry*, 52(6), 742–748.
- Swanson, M., & McGwin, G. (2004). Visual impairment and functional status from the 1995 National Health Interview Survey on Disability. *Ophthalmic Epidemiology*, 11(3), 227–239. doi:10.1080/09286580490514540
- Szabadi, E. (1991). Thyroid dysfunction and affective illness. *British Medical Journal*, 302(6782), 923.
- Tielsch, J. M., Javitt, J. C., Coleman, A., Katz, J., & Sommer, A. (1995). The prevalence of blindness and visual impairment among nursing home residents in Baltimore. *New England Journal of Medicine*, 332(18), 1205–1209.
- Taur, S., Karande, S., Saxena, A. A., Gogtay, N. J., & Thatte, U. M. (2014). Use of computerized tests to evaluate psychomotor performance in children with specific learning disabilities in comparison to normal children. *The Indian Journal of Medical Research*, 140(5), 644–648.
- Walmsley, P. T., Natali, M. W., & Campbell, J. P. (2012). Only incumbent raters in ONET? Oh Yes! Oh No!. *International Journal of Selection and Assessment*, 20(3), 283–296. doi:10.1111/j.1468-2389.2012.00600.x

# **Bullying, Students with Disabilities, and Recommendations for Prevention of Bullying**

**Emily J. Hernandez, Martin G. Brodwin, and Frances W. Siu**

Bullying is a widespread complex social problem on school grounds in the United States. Due to their vulnerability, students with disabilities are easy targets for bullying. This article discusses bullying from the perspectives of student engagement, bullying and student engagement, bullying and school leadership, school culture, students with disabilities, recommendations for prevention of bullying behaviors, and reduction of bullying for students who have disabilities or chronic medical conditions. The authors describe three examples of bullying of students with disabilities. Bullying against students with disabilities needs to be a part of school prevention programs. Recommendations are made for rehabilitation counselors, outlining strategies for prevention.

## **Background**

Fifteen years ago, the U.S. Department of Education (2000) reported that every seven minutes, a child is bullied and every 26 seconds, a student gives up on school, contributing to the more than 1.2 million students annually dropping out of high school. Approximately one-third of all public high school students and one-half of all minority students fail to graduate with their class every year. The United States ranked 18th in high school graduation rates (Balfanz, Bridgeland, Moore, & Fox, 2010). This data was the impetus for an increased focus on dropouts and graduation rates by school districts nationwide. The U.S. Department National Center for Education Statistics (2016) reported an increase in the graduation rate in 2013-14 to 82%. Graduation rates were lowest for Hispanic, Black, and American Indian/Alaska Native students at 76%, 73%, and 70% respectively. Some states reported lower graduation rates for minority students in the 50 and 60 percentile ranges.

The dropout rate decreased significantly over the last 15 years, and in 2014 was reported as 6.5%. Again, the dropout rates for minority youth were significantly higher for Black and Hispanic youth at 7.4% and 10.6% respectively. Nearly 34% of states graduate less than 70% of Hispanic, Black, and low income students. Thirty-three states graduate less than 70% of their students with disabilities, while six of those states graduated less than 50% of students with dis-

abilities. As a result of national evidence-based education reforms, the nation has made considerable progress in graduating more students and reducing dropouts, but pervasive gaps and trends continue to exist and the dropout problem persists, in particular, for low income, minority, Limited English Proficient (LEP), and students with disabilities (Balfanz et al., 2014).

The consequences of dropping out have detrimental effects on the future of young students. Dropouts are more likely to be unemployed, in poor health, living in poverty or on public assistance, and becoming single parents of children who also drop out of school (Balfanz et al., 2010). Dropouts are more than eight times more likely to serve time in jail or prison than are high school graduates, four times less likely to volunteer in their communities, half as likely to vote, and represent only three percent of actively engaged citizens in the United States. The negative long-term consequences of dropping out have a direct impact on quality of life and society.

Student dropout has been linked to bullying (Hutzell & Payne, 2012). Bullying is a learned behavior of abuse where the abuser exerts power to take control of the abused individual. Like many other types of abuse, it comes in many forms, involves various aspects of people's lives, and impacts abused individuals' loss of productivity in school and unknown psychological distress. Most bullies have an aggressive personality and a strong desire to be in charge; they

lack empathy and remorse, as well as enjoy gossiping and spreading rumors to maliciously exclude their victim(s) from the group. They often intimidate and humiliate their “preys” in person and/or through the use of social media. In general, male bullies are more likely to engage in observable bullying tactics, such as physical aggression, while female bullies are more likely to use less observable tactics, such as intimidation and encouraging others to stay away from a certain student (McNamara, 2013).

Olweus (1994) defined bullying as unwanted, intentional, aggressive behavior that involves a real or perceived power imbalance that is often repeated over time. A second definition of bullying is “any aggressive behavior of a more powerful person or group toward a less powerful person” (Hong, Neely, & Lund, 2015, p. 157). Traditional bullying behaviors range from teasing, name calling, taunting, stealing and damaging victim’s personal belongings, to pushing, shoving, intimidation, threatening with or without a weapon, physical aggression, and shaming the victims where some resulted in suicide. Cyberbullying is the use of technology to inflict harm on others. Examples include technological devices such as computers, cellphones, and social media like Facebook, messaging, YouTube, and Twitter. Although all the offenses take place outside of the school setting, the impact is felt in school (McNamara, 2013).

Bullying of students is a significant factor in students dropping out of school (Hutzell & Payne, 2012). Dropping out of school is a process of slow disengagement and is identifiable as early as elementary school. Warning signs include poor attendance, disruptive behavior, and failing grades in middle and early high school (Balfanz et al., 2010). These early warning signs of student disengagement are indicative of risk of dropping out of school, and early warning signs of possible bullying victimization. In particular, attendance is often a key barometer of a student’s connection with school. The effects of bullying and the early warning signs of student dropout are similar: academic failure, disciplinary problems, at risk behaviors, social and psychological issues, poor attendance, and student disengagement. It is a contributing factor of student disengagement leading to school dropout.

## Student Engagement

Student engagement has been widely studied in educational research and is a term used to measure a student’s relationship to school. Finn (1989) was among the first to define school engagement as the extent to which a student is invested in school and participates in school-related activities. Common terms in health and education literature include school engagement, school attachment, school bonding, school climate, school involvement, teacher support, and school

connectedness (Libbey, 2004). For the purpose of this article, the term school engagement refers to a student’s relationship or connection to school. While there are many terms used to describe student engagement, there are several consistent themes that relate to student engagement: sense of belonging and being a part of a school, whether or not students like school, level of teacher supportiveness and caring, presence of good friends in school, engagement in current and future academic progress, fair and effective discipline, and participation in extracurricular activities.

Student engagement has been found to be highly associated with student learning outcomes. Student engagement has repeatedly demonstrated to be a robust predictor of achievement and behavior in schools. Libbey (2004) reported that “young people who feel connected to school, that they belong, and that teachers are supportive and treat them fairly, do better” (p. 282). In addition, student engagement has been found to be linked to multiple educational outcomes such as achievement, attendance, behavior, and dropout/completion. Researchers have identified that effective interventions to promote student engagement also enhances the probability of high school completion (Barry & Reschly, 2012; Zeydyk, 2014).

## Bullying, Student Engagement, and School Leadership

Bullying and peer aggression generally have long-term negative effects on the student’s level of engagement in school. It has been found to affect engagement in school, attendance, behavior, and academic performance. Additionally, it has been linked to the dropout rate of students (Gastic, 2008). In their national survey study of over 11,000 secondary students, Hutzell and Payne (2012) found an association between bullying victimization and avoidance behaviors in school. Students bullied at school would skip school to avoid the bully prone location. The development of avoidance behaviors in students involved in bullying has an impact on their level of connectedness to school.

Bullying has an impact on a student’s overall adjustment to school, which affects their level of engagement. Research has shown that victims of bullying exhibit poor social and emotional adjustment, lower social skills and abilities to make friends, poor relationships with classmates, and experience higher levels of anxiety and loneliness (Harris & Petrie, 2002; Zeedyk, 2014). Further, students who perceive high levels of bullying in their schools may become less engaged in school and, consequently, be less motivated to learn. This disengagement contributes to problems with school attendance, including truancy and dropout (Klein, Cornell, & Konold, 2012). Bullying is an es-



sentential topic for all school leaders. Becoming aware and comprehending the phenomenon of bullying is essential for school leaders to effectively foster an anti-bullying culture. Victimization and bullying have become a central concern for all participants of the educational community. Harris and Petrie (2002) found that bullying was a major problem and reported that bullying is a crucial issue for school leaders to consider. In 2006, 43% of middle school administrators and 21% of elementary administrators reported dealing with daily or weekly incidents of bullying in their schools (Noelle, Guerino, Dinkes, & Chandler, 2007). The federal government recognized that there were plenty of bullying and intervention programs. What is missing is leadership in raising awareness and describing what to do about bullying. Principal awareness of the problem leads to administration involvement. Awareness and involvement reduces bullying. A reduction in bullying is likely to produce an improved school experience for children and youth. Making bullying prevention a priority helps ensure the well-being of youth.

### **Bullying Reduction and School Culture**

School bullying is a complex issue that calls for a comprehensive approach based on the needs of the school culture (Hong et al., 2015). Using conflict resolution or mediation strategies to address issues of bullying may undermine effective bullying intervention. These strategies may exacerbate the bullying situation in that they fail to take into consideration the fact that bullying is not the result of simple conflict; rather, it involves the exploitation of a serious imbalance of physical and social power. Furthermore, group treatment strategies for bullying are counterproductive in that group members may serve as role models and reinforce bullying behaviors (Limber, Flerx, Nation, & Melton, 1998). Instead, bullying is a multi-faceted, systemic problem that demands long term, comprehensive, and coordinated school-wide interventions.

Evidence-based interventions should be used to effectively address the serious issue of bullying at schools. Many strategies and interventions that are commonly used by schools, such as zero tolerance policies, have proven ineffective. The concept of zero tolerance is a strategy that continues to be utilized despite evidence of ineffective outcomes. Zero tolerance policies are based on the premise that schools will accept no amount of violence or threats of violence to deter any incidents from occurring (Borum, Cornell, Modgeleski, & Jimerson, 2010).

However, the consensus is that zero-tolerance policies do not work and actually may cause more harm than good. Evidence shows that zero tolerance policies fail to address the underlying issues of the behavior. Re-

search has shown that harsh penalties are rarely given for severe offenses, but rather for lesser incidents. These policies have been highly criticized for resulting in disproportionate discipline of minorities (Borum et al., 2010). Overall, zero-tolerance policies are unsupported by research to be effective in preventing or reducing bullying.

Leadership involving a whole school strategy as an intervention has been found to be most effective in addressing problems of school bullying. Anti-bullying activities need to address all factors surrounding the problem. A central tenet of bullying prevention efforts is that bullying is a school-wide problem involving bystanders, as well as aggressors and their victims. Sherer and Nickerson (2010) discussed bullying prevention and intervention strategies that need to take place in five categories - systems-level interventions, school staff and parent involvement, educational approaches with students, student involvement, and interventions with bullies and victims.

A school wide anti-bullying policy provides the framework that guides the school actions to address problems with bullying. These types of policies have been widely accepted by anti-bullying programs internationally and have been shown to be effective (Hanewinkel, 2004). However, these frameworks have been used less consistently in American schools. Sherer and Nickerson (2010) found that, in American schools, a variety of strategies are used to address bullying, but most occur at the individual bully and victim level as opposed to more system-wide interventions. Specifically, seven out of ten most frequently implemented strategies were individual interventions with bullies and victims such as talking, counseling, avoiding contact with bully and victims, and disciplining students who bully. Additionally, the least frequently used strategies were found to be system-level interventions, without effective leadership. What is suggested is the use of an anti-bullying committee, taking surveys, involving students in prevention, direct intervention, and the use of resources and training for nonteaching staff.

The most positive methods of bullying reduction involve a whole-school approach. Within this approach, successful strategies include assessing the problem, planning school conference days, providing better supervision, forming bully prevention committees, encouraging parent teacher meetings, establishing classroom rules against bullying, classroom meetings about bullying, requiring talks between bullies and victims, and scheduling talks with involved parents. Klein et al. (2012) showed the significance of the school climate as a protective factor in preventing both bullying and student risk behavior. The school-wide approach is predicated on the idea that bullying can best be reduced by changing the school climate while specifically addressing the culture of

bullying that encourages peer aggression. Having an experienced professional take a leadership role is instrumental to success.

Providing support services at the school site is a needed component in addressing problems of bullying. The Interdisciplinary Group on Preventing School and Community Violence (2012) addressed the need for improved mental health services in schools. The report discussed the pivotal role of access to mental health services for youth and adults who show signs of psychological distress, depression, anxiety, withdrawal, anger, and aggression, with support for victims' families. Glew, Fan, Katon, and Rivara (2008) found that associations between involvement and academic achievement, psychological distress, and the belief that it is not wrong to take a weapon (knife or gun) to school reinforce the notion that school environment is interrelated with mental health and school success. Further, Hoover and Oliver (1996) discussed the role of involving school counselors in a more significant way. Support services should be available at schools to provide academic support and resources to bully victims, especially those with inconsistent or irregular attendance and/or problem behaviors. Support services and health practitioners evaluating students exhibiting psychological and psychosomatic symptoms should consider bullying and the student's school environment as potential causes.

School climate has been studied as a factor to be considered in addressing school bullying. It is necessary to identify important aspects of school climate that can either facilitate or impair student engagement in school. Student perceptions of the extent of bullying at school are consistently associated with the levels of school engagement at both the individual student and the school-wide levels (Mehta, Cornell, Fan & Gregory, 2013). These researchers argued for school-wide prevention and intervention efforts that are designed to improve the school climate and associated experiences for all students.

School leadership is the most critical component in fostering an anti-bullying culture, and will determine the systems and structures in place at a school. There are many strategies that can be used to address and prevent bullying at schools. Strategies and evidence-based programs that emphasize the interrelated impact of family, school culture, and communities need to be practical.

## **Bullying and Students with Disabilities**

Children with disabilities are two to three times more likely to be bullied, and with greater frequency. About 60% of students with disabilities report having been harassed regularly compared with 25% of all students (PACER'S National Bullying Prevention Center, 2012). Disability harassment was defined by PACER'S Na-

tional Bullying Prevention Center as unwelcome conduct (verbal abuse, name-calling, epithets, or slurs), graphic or written statements, threats, physical assault, or other conduct that may be physically threatening, harmful, or humiliating. PACER indicated that the Office for Civil Rights (OCR) and the Department of Justice (DOJ) specified that bullying may be considered harassment when it is based on a student's race, color, national origin, sex, disability, or religion. Disability is considered to be a civil rights issue, and people with disabilities are protected by legal statutes, such as the 1973 Rehabilitation Act and the 1990 Americans with Disabilities Act (ADA).

In the context of disability, children with disabilities and chronic medical conditions are likely to be more frequent targets of peer victimization, especially by peers who have higher social status and greater social power (Rose, Espelage, Aragon, & Elliot, 2011; Zeedyk, 2014). It has been shown that students with both visible and non-visible disabilities are more often victimized and bullied than students who do not have disabilities. In fact, "bullying and victimization are often a direct result of a student's disability" (Young, Ne'eman, & Gelsner, 2011, p. 2). A student on the autism spectrum is likely to have repetitive activities, stereotyped motions, and resistance to change in daily routines that are easy targets of mocking and taunting the victim repeatedly (McNamara, 2013).

Little's study (2002) on students with Asperger's Syndrome found that 94%, as reported by their mothers, had been victimized by classmates and others. Up to 75% of these individuals underwent emotional bullying. The types of victimization reported by Little included emotional bullying (75%), gang attacks (10%), and nonsexual attacks to the genitals (15%). Students with Attention Deficit/Hyperactivity Disorders (ADHD) often face bullying two to three times a month. Students with all types of disabilities face higher percentages of peer rejection, which places them at greater risk for bullying and victimization by other students. "Persons with autism spectrum disorder have a particularly high incidence rate of becoming victims of bullying" (Hong et al., 2015, p. 158).

Raskauskas and Modell (2011) reviewed multiple past studies on students with disabilities and bullying and found that over 50% of students with learning disabilities, intellectual disabilities, speech-language disabilities, or autism reported abuses from school peers. These abuses were frequent and included teasing, harassment, and physical attacks. These researchers also found that studies noted 55% of students with mild learning disabilities and 78% of students with moderate learning disabilities described repeated acts of being bullied. In comparison, their peers without disabilities reporting being bullied significantly less.

Holzbauer (2008) interviewed special education teachers in a large public school district. These teachers re-



ported on direct observations of harassment occurring to their students. “The most frequent reported types that occurred many times, in rank order, included epithets, slurs, mimicking, mockery, and staring. Overall, 96.7% of the participants reported that they observed more than one incident of this school-related disability harassment conduct” (p. 162). This researcher noted that these reported incidents in special education had a low priority for both policy makers and administrators.

Weber (2007) provided examples of harassment of students with disabilities by their peers in school. Three of these are cited below:

MP, with a diagnosis of schizophrenia, was a student in 8th grade. According to him and supported by his parents, MP experienced ruthless and persistent bullying by other students. A paraprofessional working with him described the occurrences to the school administration. MP was called druggie, fag, wierdo, mental kid, special, squealer, idiot, among other names. They shoved his head into the drinking fountain, picked him up by the throat, slammed him into lockers, threw him to the floor, shoved, scratched, spat on, and cut him. His mom complained and the school did nothing (p. 37).

DG was a student with a development disability and dyslexia. He was thrown to the ground, body ‘slammed’, physically beaten by being held down and hit on the head and back with his own binder, subjected to disability-related slurs, and his school books were thrown into the garbage. This bullying occurred five to eight times in the school cafeteria. On the school bus, he was called a retard and other students started a fist fight with him. Another took his planner while two other students taunted and hit him while on the bus. The school was informed of this several times. The district took no effective action; school representatives told DG’s mother to simply keep him out of school. DG developed depression and suicidal ideation (pp. 38–39).

RL, a student with a physical disability, was continually bullied and harassed, as was his mother. This led to RL having increased absenteeism. Ultimately, this child committed suicide with no warning that this might occur (p. 39).

The case examples above illustrate the importance of adult intervention in addressing instances of bullying. When providing intervention, the individual must be both assertive and calm. If during an incident, one stands between the bully and the target, blocking eye contact between the two. Try to safeguard the target, if all possible. Express strong disapproval of bullying. Address the bully directly. Start with verbal warning, label the behavior as bullying, and refer to the school’s anti-bullying rules and policies. Report the incident as required, and maintain a log of bullying incidents on

campus. Deal with all bullying incidents consistently. It is essential for school faculty, staff, and paraprofessionals to learn about bullying and the schools’ policies on bullying, including consequences for bullies and supports for students being bullied (McNamara, 2013).

As noted by Orange (2014), “anxiety due to depression may cause an individual to withdraw and, as a result, lead to depression and loneliness” (p. 289). Further, this situation can become problematic for the person to recognize his or her role within the school and society. Livneh and Antonak (2012) reported that individuals with chronic illnesses and disabilities normally face an increase in the frequency and severity of stressful occurrences. They need to cope with daily threats, including to one’s life and well-being. The sense of self (self-identity) may be negated in interactions with others who treat the person as “disabled first. The person can lose a sense of his or her real identity; self-esteem may be diminished, with the individual showing signs of erosion and negative self-perceptions following these encounters.

Harassment and bullying may have an effect on all the following areas, which are already affected by having a chronic condition or disability: increased stress, crisis, loss and grief, body image, self-concept, stigma, uncertainty, unpredictability, and the overall quality of one’s life (Hong et al., 2015). The ultimate psychosocial outcome in rehabilitation practice for counselors working with youth with disabilities is enhanced well-being and quality of living. Bullying negatively affects the person’s quality of life, and can lead to increases in depression, anxiety, loss, and the overall ability to adjust to one’s disability.

### **Recommendations for Rehabilitation Counselors for Bullying Prevention**

The role of the rehabilitation counselor in preventing bullying is an integral component to decreasing this activity in schools and may help all students, not just those who have disabilities. Recommendations for rehabilitation counselors in bullying prevention are the following:

- 1) A whole-school or district-based response to bullying with effective leadership is needed to help teachers stem school bullying. This includes taking responsibility for changing the culture of bullying (Mehta et al., 2013). An integrative whole-school approach is key to success of any program (Raskauskas & Modell, 2011).
- 2) A response to school bullying can begin with a needs assessment or survey, including students with disabilities. An example is Olweus’s (1996) Bully/Victim Questionnaire, a commonly used form for prevention. This is an anonymous self-re-

- port questionnaire, which includes items related to physical, verbal, indirect, racial, and sexual kinds of bullying.
- 3) Make available in-service training and professional education of all teachers, administrators, and staff on the various aspects of disability.
  - 4) Build awareness that disability harassment and bullying are prevalent in schools. Bullying based on disability is similar to sexual, gender, and racial harassment (Holzbauer & Conrad, 2010; Shaw, Chan, & McMahon, 2012).
  - 5) Recognize the importance of and need for advocacy, disability awareness, and acceptance of disability (Livneh & Antonak, 2012). This includes teaching students with disabilities how to self-advocate by notifying school personnel and parents when they are being harassed.
  - 6) Create a school environment that is aware of and supportive of disability concerns and harassment (U.S. Department of Education, 2000).
  - 7) Implement an effective school monitoring program (U.S. Department of Education, 2000).
  - 8) Modify anti-bullying programs already in place to encompass students with disabilities (Raskauskas & Modell, 2011).
  - 9) Enhance student engagement, effective leadership, and team building. Establish and encourage positive interactions among students with and without disabilities (Hong et al., 2015). Develop a program to increase understanding, awareness, and sensitivity (U.S. Department of Education, 2000).
  - 10) Involve teachers, administrators, staff, and students, as well as parents, PTA, and other community members. Confirm that students with disabilities are included (Raskauskas & Modell, 2011).
  - 11) Offer counseling services for victims, as well as perpetrators.
  - 12) Monitor programs to follow-up on resolved issues to see if they remain effective and continue to be resolved.
  - 13) Prevention programs need to include training on the importance of respecting others, accepting differences, and building empathy (Raskauskas & Modell, 2011).
  - 14) Emphasize "holding schools accountable for severe, persistent, and pervasive bullying and harassment" (Young et al., 2011, p. 6).
  - 15) Create a shared vision as a foundation to an integrated whole-school approach.
  - 16) Cultivate a culture which prevents bullying (Migliaccio, 2015).
  - 17) Develop a detailed protocol for school supervision to create and/or maintain safety (Young et al., 2011).
  - 18) Focus on student engagement and safety, both on and within the immediate area of campus, including the school bus system and afterschool programs (Weber, 2007; Young et al., 2011).
  - 19) Require parental notification of incidents of bullying (Young et al., 2011).
  - 20) Understand the 'power of bystanders' to acts of bullying. Encourage peer intervention. Research has demonstrated that more than 50% of bullying stops when a peer intervenes (PACER'S National Bullying Prevention Center, 2012).

## References

- Balfanz, R., Bridgeland, J. M., Moore, L. A., & Fox, J. H. (2010). *Building a grad nation. Progress and challenge in ending the high school dropout epidemic*: Baltimore, MD: John Hopkins University Civic Enterprises.
- Balfanz, R., Bridgeland, J. M., Fox, J. H., DePaoli, J. L., Ingram, E. S., & Maushard, M. (2014). *Building a Grad Nation: Progress and Challenge in Ending the High School Dropout Epidemic. Annual Update 2014*. John Hopkins University Civic Enterprises.
- Barry, M., & Reschly, A. L. (2012). Longitudinal predictors of high school completion. *School Psychology Quarterly, 27*, 61–73.
- Borum, R., Cornell, D. G., Modzeleski, W., & Jimerson, S. R. (2010). What can be done about school shootings? A review of the evidence. *Educational Researcher, 39*(1), 27–37.
- California Department of Education. (2012). *Data and statistics*. Sacramento, CA: Author.
- Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research, 59*(2), 117–142.
- Gastic, B. (2008). School truancy and the disciplinary problems of bullying victims. *Educational Review, 60*(4), 391–404.
- Glew, G.M., Fan, M-Y, Katon, W., & Rivara, F. P. (2008). Bullying and school safety. *Journal of Pediatrics, 152*(1), 123–128.
- Hanewinkel, R. (2004). Prevention of bullying in German schools: An evaluation of an anti-bullying approach. In P. K. Smith, D. Pepler, & K. Rigby (Eds.), *Bullying in schools: How successful can intervention be?* (pp. 81–97). Cambridge, MA: Cambridge University.
- Harris, S., & Petrie, G. F. (2002). A study of bullying in the middle school. *National Association of Secondary School Principals Bulletin, 86*, 42–53.
- Holzbauer, J. J. (2008). Disability harassment observed by teachers in special education. *Journal of Disability Policy Studies, 19*, 162–171.

- Holzbauer, J. J., & Conrad, C. F. (2010). A typology of disability harassment in secondary schools. *Career Development for Exceptional Individuals*, 33(3), 143–154.
- Hong, E. R., Neely, L., & Lund, E. M. (2015). Addressing bullying of students with autism: Suggestions for families and educators. *Intervention in School and Clinic*, 50(3), 157–162.
- Hoover, J. H., & Oliver, R. (1996). *The bullying prevention handbook: A guide for principals, teachers, and counselors*. Bloomington, IN: National Educational Service.
- Hutzell, K. L., & Payne, A. A. (2012). The impact of bullying victimization on school avoidance. *Youth Violence and Juvenile Justice*, 10(4), 370–385.
- Interdisciplinary Group on Preventing School and Community Violence. (2012). Connecticut school shooting position statement. *Journal of School Violence*, 12(2), 119–132.
- Kena, G., Hussar, W., McFarland J., de Brey, C., Musu-Gillette, L., Wang, X., Zhang, J., . . . Dunlop Velez, E. (2016). *The Condition of Education 2016* (NCES 2016-144). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved 08/02/2016 from <http://nces.ed.gov/pubsearch>
- Klein, J., Cornell, D., & Konold, T. (2012). Relationships between bullying, school climate, and student risk behaviors. *School Psychology Quarterly*, 27(3), 154–169.
- Libbey, H. P. (2004). Measuring relationships to school: Attachment, bonding, connectedness, and engagement. *Journal of School Health*, 74(7), 273–283.
- Limber, S. P., Flerx, V. C., Nation, M. A., & Melton, G. B. (1998). Bullying among school children in the United States. *Contemporary Studies in Sociology*, 18, 159–174.
- Little, L. (2002). Middle-class mothers' perceptions of peer and sibling victimization among children with Asperger's Syndrome and nonverbal learning disorders. *Issues in Comprehensive Pediatric Nursing*, 24, 43–57.
- Livneh, H., & Antonak, R. F. (2012). Psychological adaptation to chronic illness and disability: A primer for counselors. In I. Marini & M. A. Stebnicki (Eds.), *The psychological and social impact of illness and disability* (6th ed., pp. 95–107). New York, NY: Springer.
- McNamara, B. E. (2013). *Bullying and students with disabilities: Strategies and techniques to create a safe learning environment for all*. Thousand Oaks, CA: Sage.
- Mehta, S., Cornell, D., Fan, X., & Gregory, A. (2013). Bullying climate and school engagement in ninth grade students. *Journal of School Health*, 83, 45–52.
- Migliaccio, T. (2015). Teacher engagement with bullying: Managing an identity within a school. *Sociological Spectrum*, 35(1), 84–108.
- Noelle, K. L., Guerino, P., Dinkes, R., & Chandler, K. (2007). *Crime, violence, discipline, and safety in U.S. public schools. Findings from the school survey on crime and safety: 2005-2006*. Washington, DC: National Center for Education.
- Olweus, D. (1994). Bullying at school: Basic facts and effects of a school based intervention program. *Journal of Child Psychology and Psychiatry*, 35(7), 1171–1190.
- Olweus, D. (1996). *Olweus Bullying Prevention Program*. Center City, MN: Hazelden.
- Orange, L. M. (2014). Sexual health and disability. In M. G. Brodwin, F. W. Siu, J. Howard, E. R. Brodwin, & A. T. Du (Eds.), *Medical, psychosocial, and vocational aspects of disability* (4th ed., pp. 285–293). Athens, GA: Elliott & Fitzpatrick.
- PACER'S National Bullying Prevention Center. (2012). *Bullying and harassment of students with disabilities*. Minneapolis, MN: Author.
- Raskauskas, J., & Modell, S. (2011). Modifying anti-bullying programs to include students with disabilities. *Teaching Exceptional Children*, 44(1), 60–68.
- Rose, C. A., Espelage, D. L., Aragon, S., & Eliot, J. (2011). Bullying and victimization among students and special education and general education curriculum. *Exceptionality Education International*, 21(3), 2–14.
- Shaw, L., Chan, F., & McMahan, B. T. (2012). Intersectionality and disability harassment: The interactive effects of disability, race, age, and gender. *Rehabilitation Counseling Bulletin*, 55, 82–91.
- Sherer, Y.C., & Nickerson, A. B. (2010). Anti-bullying practices in American schools: Perspectives of school psychologists. *Psychology in the Schools*, 47(3), 217–229.
- Stark, P., and Noel, A. M. (2015). *Trends in High School Dropout and Completion Rates in the United States: 1972–2012* (NCES 2015-015). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved on 08/02/2016 from <http://nces.ed.gov/pubsearch>.
- U.S. Department of Education. (2000). *The condition of education*. Washington, DC: Author.
- Weber, M. C. (2007). *Disability harassment*. New York, NY: New York University.
- Young, J., Ne'eman, A., & Gelser, S. (2011). *Bullying of students with disabilities in mainstream education*. Washington, DC: National Council on Disability.
- Zeedyk, S. M. (2014). Bullying of youth with ASD, intellectual disability, or typical development: Victim and parent perspectives. *Research on Autism Spectrum Disorders*, 8, 1173–1183.





# Worklife Expectancy and Disability in the Forensic Arena: A Response to Chapter 20 “Worklife Expectancy Models and Concepts” in Rick Robinson’s *Foundations of Forensic Vocational Rehabilitation*

Enrique N. Vega and Joseph T. Crouse

Here is a middle-aged woman, very overweight, badly scarred on one arm and one leg, unsteady on her feet, in constant and serious pain from the accident, with no education beyond high school and no work skills other than cooking, a job that happens to require standing for long periods which she is incapable of doing. It seems unlikely that someone in this condition could find gainful work at the minimum wage. True, the probability is not zero; and a better procedure, therefore, might have been to subtract from Mrs. O’Shea’s lost future wages as a boat’s cook the wages in some other job, discounted (i.e., multiplied) by the probability—very low—that she would in fact be able to get another job.<sup>1</sup>

Judge Richard Posner, a prolific writer with a libertarian streak, wrote this opinion some 35 years ago and ushered an unprecedented era of data driven, probabilistic decision making in cases of expected loss of earning capacity. Forensic economists and rehabilitation consultants have since considered, not only an individual’s adjusted ability to work post injury (i.e., different or diminished occupational choices), but also, the probabilities of employment, or the “how long” portion of the loss. “A better procedure” indeed was born, with this jurist’s astute insight as to the plaintiff’s low probability of employment in the post-injury period.

In a forensic setting, damages are not calculated unless damages are sought. The model used in assessing loss of lifetime earnings due to injury is very basic. The model was not created by the authors, but is simply widely used in assessments of future earning capacity loss in order to fulfill the needs of the Court. Key elements used by all experts are as follows:

1. Lifetime earnings absent injury – this includes both how much the Plaintiff could have earned and how long the Plaintiff could have worked (worklife expectancy);

2. Lifetime earnings with injury – this includes both how much the Plaintiff can earn and how long the Plaintiff can be expected to work with the injury (worklife expectancy);
3. Present value assessment – this includes the determination of appropriate compensation growth and discount factors (performed by the forensic economist).

Worklife expectancy is the “how long” part of the estimation of lifetime earnings loss. Currently there are a variety of Worklife Expectancy tables in wide use in forensic and non-forensic arenas. These tables are used to obtain an estimate of the number of working years a person is expected to have before exiting the labor market. There are several variables that need to be taken into consideration when obtaining worklife expectancy values for a particular individual. The main variables are typically age, gender, level of education, and disability status. There may be other factors, but in general, the more variables that are added, the lower the inference power of the tables due to the erosion of sample size.

Over the years, a number of consultants have objected to the use of worklife expectancy tables. It is argued

that the values produced cannot be relied upon because they are simply flawed science.

Rick Robinson's textbook *Foundations of Forensic Vocational Rehabilitation* provides a summary of these criticisms in Chapter 20 titled, "Worklife Expectancy Models and Concepts", authored by George Barrett, Kent A. Jayne, and Rick Robinson (hereafter referred to as BJR). BJR open the chapter stating,

*When evaluating losses related to a reduction in a worker's prospective vocational capacity, it is necessary to estimate the number of years over which the loss is likely to take place. This estimate is referred to as a worker's worklife expectancy.*<sup>2</sup>

This perfectly sensible statement is then followed by an ominous warning, two sentences later, which sets the tone of the chapter:

*On the surface, this estimate may seem to be a straight forward process that is easily calculated. In reality, estimating a person's work behavior is not so clear and may change over time.*<sup>3</sup>

The authors go to great lengths to find technical problems with estimates of worklife expectancy, in essence, because there are too many moving parts—too many variables to account for in a model. BJR further declare that estimating worklife expectancy for persons with disabilities is even less straightforward, because, they admit, disability interacts ("interferes") with an individual's participation in the labor market, "causing periods or interruption or inactivity".<sup>4</sup> BJR did not conceive the notion that disability may also terminate worklife altogether, or shorten it as the aging process unfolds. However, the authors agree that disability reduces labor force participation in employment:

*A 2010 Bureau of Labor Statistics (BLS) report clearly shows a strong relationship between disability and discontinuous or decreased participation in the labor force (U.S. Department of Labor, 2010). Highlights from this report indicates that for all ages, the employment-population ratio was much lower for persons with disability than for those with no disability; the unemployment rate of persons with disability was well above for those with no disability...nearly one third of workers with a disability were employed part-time, compared with about one fifth of those with no disability.*<sup>5</sup>

A quick look at the front webpage for the U.S. Department of Labor, Office of Disability and Employment Policy will confirm that persons with disabilities have twice the unemployment rate than those without disabilities and have three times lower labor force participation.<sup>6</sup>

The fact is that the presence of disability is widely known to have an adverse effect on an individual's ability to work, all other things remaining equal (*cet-*

*eris paribus*). This is widely known in vocational rehabilitation circles, and there are very few rehabilitation professionals who will disagree with that assessment. Disability, by its very definition, is a reduction of ability or lack thereof. As Gamboa et al. (2009) state:

The presence of a permanent, partial disability is widely known to affect both earnings and worklife expectancy. This finding is documented in results from various surveys, including the Decennial Census, Current Population Survey (CPS), American Community Survey (ACS), and Survey of Income and Program Participation (SIPP) from the Census Bureau;<sup>7</sup> the National Health Interview Survey (NHIS) from the National Center for Health Statistics;<sup>8</sup> and the *N.O.D./Harris Survey of Americans With Disabilities*.<sup>9</sup> The disability effect is the cause of such events as the passage of the well-known Americans with Disabilities Act (ADA),<sup>10</sup> the existence of the Department of Labor's Office of Disability Employment Policy (referenced above), and the practice of rehabilitation counseling.<sup>11</sup>

BJR write that the LPE method (consisting of the joint probabilities of life, participation, and employment) of measuring worklife expectancy has been "effectively criticized" and cite a number of papers by economists and others who have been critical of its use; similarly, they are critical of the use of transitional probabilities (in the Markov case), because there is "a plethora of exogenous and endogenous independent variables which may dramatically influence the labor force decisions of individuals, now and in the future." Such variables include business cycles, recessions, mortgage rates, fiscal policy, the individual's health, family size and consumption, education needs, marital status, changing skill sets, beliefs, and hopes for the future.<sup>12</sup> Indeed, the reader of the BJR chapter should be scared to ever consider any worklife expectancy tables at all, as the authors write, "it should be obvious, given that one year of past performance is not a reliable predictor of future results, that worklife expectancy estimation is at best a flawed science."<sup>13</sup>

This "flawed science" theme is at the heart of the BJR chapter. It is meant to discourage, rather than enlighten, the reader of the book. The fact is that worklife expectancy tables are routinely used in thousands of cases every year, and they represent a true aid to the Trier of Fact in determining how to award economic damages. Without worklife expectancy tables, such computations would be reduced to a guess, or as performed a few decades ago, assuming a straight number of years to age of retirement (typically 65, increasingly now to 66 or 67, depending on date of birth).

For example, assuming that a 25-year-old male with a high school education has 40 years of worklife (to age 65) grossly overstates his actual participation in the labor force. The more proximate value is 30 to 32 years, depending on which worklife table is used. This

is the case because men with high school education spend significant portions of time in and out of employment. To simply assume that such a person would work without experiencing any periods of unemployment is wrong. Employability and employment rates, are sensitive to levels of education. To illustrate, a 25-year-old man with a master's degree will have an estimated 36 to 37 years of worklife, again, depending on which tables are used. The point is that this better-educated young man will still have a lower worklife than 40 straight years, again due to the high likelihood that this person will experience some unemployment. Using empirical data as presented in worklife expectancy tables is far more preferable to assuming 40 years of worklife for a 25-year-old. Exact forecasts are impossible because, for any particular individual, no one can predict the future.

It is precisely for this reason that forecasting a plaintiff's future earnings stream is not an exact science: no one can predict the future with absolute certainty. But, through the use of statistics and the application of professional judgment, experts can predict the future with reasonable scientific certainty. Furthermore, all data has limitations. Yet, very good estimates can be obtained from empirical sources of data. Any individual assessment will require that the forensic practitioner choose several sources of data and the manner in which he or she applies the data to the individual, which may generate a difference of opinion.

In this regard, "general acceptance" does not require universal or majority usage in the relevant community. Peer-reviewed journals frequently publish articles espousing opposing viewpoints, providing an outlet for professional discussion; they are not necessarily the universally accepted ideas or methods in the field. There is no single step in the loss computation process that enjoys universal acceptance in the vocational and economic communities. As such, it is predictable that experts may disagree on the method for computing lost earnings. This is true of defining expected earnings, computing worklife expectancy, projecting earnings growth, and determining discount rates. However, the underlying data and computational methodology that is used in all worklife expectancy tables have substantial (general) acceptance throughout the vocational, economic, and disability research communities, as well as in federal and state courts.

Utterly lacking in the discussion of worklife expectancy in BJR's chapter is any discussion as to what the courts have said in regards to worklife expectancy tables. While critics of worklife expectancy tables have been given a bullhorn, their supporters have been reduced to a couple of observations. BJR fail to mention articles favorable to worklife expectancy and government data supported by other peer-reviewed articles of a forensic or non-forensic nature.

For example, John Johnson wrote an article entitled "Assessing Risk in Enhanced Earnings Valuations." In this article he discusses the value of the Gamboa Gibson worklife expectancy statistics and of the Life, Participation, Employment method of calculating worklife expectancy for the calculation of earnings in matrimonial litigation. Misra, Bua-lam, and Majumder wrote an article discussing the value of the worklife statistics when performing cost-benefit analyses of rehabilitation programs.

Forensic vocational consultants and economists use worklife expectancy tables because they know that a 25-year-old does not have 40 years of worklife remaining. It is less, and in some instances, considerably less.

### **Gamboa Gibson Worklife Expectancy Tables**

A discussion of the Gamboa Gibson Worklife Expectancy Tables (GGWT) appears on pages 415-416 of BJR's chapter. The GGWT tables are the only tables in the United States that address worklife expectancy with and without disabilities and which are most suitable to use in cases of permanent partial disability. BJR acknowledge that GGWT's intent is to "draw distinctions" between labor force participation and employment rates of individuals with and without disabilities, and that "such application would ideally be quite beneficial in the projection earnings of individuals involved in personal injury litigation."<sup>14</sup> As a matter of fact, it is: a forensic consultant would consult the tables to obtain estimates of employment and labor force participation rates for an individual before and after injury (*ceteris paribus*).

BJR, however, proceed to warn that "significant deficiencies" in the methodology exist, "as identified within the forensic economic literature."<sup>15</sup> First, we note that forensic economic literature cited in the chapter does not include articles in favor of using the tables. Of critical importance is the lack of reference to the disability research community at large who routinely use the CPS and the ACS data to research disability issues and to make policy recommendations. The disability research community is in fact the peer community in which data from the CPS and ACS is broadly accepted as measuring the impact of disability on earnings and employment.

BJR make several inaccurate statements in the discussion of the government data utilized in the GGWT. They write, "it is generally concluded that the broad survey data available is limited in its usefulness to describe the work experience of individuals with specific work disabilities."<sup>16</sup> A qualification of who "generally" arrives at such conclusion is in order: the handful of GGWT critics. The issue of specific work disability versus the broader work disability is brought up in countless arguments about the inappropriateness of



using the data (as in this instance case). This is untrue since the functional limitations, rather than the specific disabilities, are at the heart of applying the GGWT. For example, a foot amputation, a lower back fusion, a hip replacement, or a serious knee injury may all create ambulatory disability (as it would a work disability). Using ACS data for ambulatory disability is highly appropriate for those cases, and the courts have agreed.

In 2005, the RAND corporation looked at the issue of diminished future earning capacity of injured workers taking into consideration specific injuries, or in their language, “body parts.”<sup>17</sup> Armed with over 300,000 cases, the empirical evidence showed that when workers returned to work, they had lower earnings than a cohort of nondisabled counter parts, consistent with the findings of the major census bureau surveys. While the RAND study did not delve into issues of worklife expectancy, it showed that regardless of the “body part” workers experienced a reduction of earnings when compared to their non-disabled counter parts *ceteris paribus*. RAND went through great lengths in identifying appropriate control groups (workers of the same age, tenure, often within the same employers) to whom they would compare earnings. The heterogeneity of the impairment type goes through the funnel of functional limitations: does the person have problems walking, carrying, or lifting? When the answer is in the affirmative, depending on the type of occupation, they will experience various levels of earnings losses as RAND and every Census Bureau survey addressing disability shows this reality.

Moreover, as a provider of job placement services for persons with disabilities for over 25 years, one of the authors (Vega) would suggest that the opposite is true: the data matches the clinical experience like a hand fits a glove, which brings us to the criticism that the GGWT ignore “the positive effects of vocational rehabilitation in identifying and implementing the interventions likely to improve the labor market experience of those with acquired work disabilities.”<sup>18</sup>

Using GGWT tables does not deny the efficacy of physical, vocational or occupational therapy as the authors of this chapter suggest. Occupational, vocational and other ancillary services are routinely recommended for individuals with acquired disabilities as a way of removing barriers to employment; advocacy in their efforts to return to work is the basic philosophy of the rehabilitation counseling profession. Technology, laws, return to work programs, etc., have marginal positive effects on an individual with an acquired disability. Yet, it does not erase the impairment or the impact that the impairment has on that individual’s productivity. Impairments result in a diminution of ability (whether physical, mental, sensory, etc.) and this diminution will reduce the individual’s human capital since one or both of the precursors to human capital—intelligence and physical ability—are reduced. Importantly, it must be remem-

bered that a disability does not enhance one’s pre-injury ability due simply to occupational therapy, rehabilitation counseling, or physical therapy. Disability is, by definition, a reduction in ability. Observing the participation and employment rates of those who report an occupational disability with those who do not report such (*ceteris paribus*) indeed shows significant differences as a function of disability status.

The statement that “these data ignore the positive effects of vocational rehabilitation” cannot possibly be true since some individuals responding to the ACS and/or CPS have likely engaged in vocational rehabilitation programs. Vocational rehabilitation has been around for 100 years. These surveys do not exclude individuals who have participated in vocational rehabilitation and experienced positive effects, but rather include a wide range of individuals with a variety of experiences in order to capture the average impact of a particular functional limitation on an individual’s ability to work and earn money.

### Appellate Decisions

This section responds to the assertion that worklife expectancy tables are “flawed science” by reviewing appellate level court decisions centered around the thorough scrutiny that the issue of worklife expectancy tables, and specifically, disability worklife expectancy tables, have received. A listing of appellate court decisions favorable to the use of disability worklife expectancy is included in Appendix A of this paper:

An appellate court decision in New Jersey upheld that the expert’s opinion was properly admitted and based on reliable methodology. In *Knitowski v. Gundy* (A-5945-09T1), the court held:

*Here, the expert testimony from Dr. Gamboa was supported by facts and data concerning individuals of an educational background similar to plaintiff who had sustained a cognitive injury. The tables on which Dr. Gamboa relied are well accepted, broadly-based census data that correlate the worklife expectancy of two similarly-situated groups of wage earners matching plaintiff’s age, gender and level of education attained, the only distinction between the two groups being the absence or presence of a non-severe head injury. While it is true that some people within the ACS data may have sustained injuries greater than the injuries that plaintiff sustained, the ACS data also includes individuals who suffered a lesser injury.*

The court opinion, as if anticipating the criticisms in BJR’s chapter, addresses the fact that the data has limitations, but it is still applicable and useful for the Trier of Fact:



. . . We reject defendants' contention that Dr. Gamboa's testimony was rendered inadmissible simply because the ACS data upon which Dr. Gamboa relied was not based on data that was identical to plaintiff's occupation and injury.

This brief, but brutally effective comment on the heterogeneity/homogeneity criticism is devastating for the main claim in BJR's chapter: that a myriad of factors makes it impossible to rely on the disability worklife tables. BJR engage in the proverbial *throwing out the baby with the bathwater*, because, by detracting from the validity of worklife expectancy tables, the forensic consultant is left with no data upon which to draw an estimate of future losses of earning capacity. No data exists that will be identical to the plaintiff in question. The logic of such argument requires that the same individual exist in the data millions of times. In this instance, good data is enough; perfect data is the enemy of good data.

An appellate court decision in Michigan held that the expert was qualified to provide testimony and the methodology utilized was "sufficiently reliable to satisfy MRE 702 and MCL 600.2955(1). In *Figurski v Trinity Health*, (11-26468-NH) the court stated the following:

*The Court agrees with Gamboa that forecasting future earnings is not an exact science. Furthermore, "general acceptance" does not require that 100% of the community accept his methodology. Or, that he have a degree in economics.*

*This Court is convinced that Gamboa's methodology is sufficiently reliable to satisfy MRE 702 and MCL 600.2955(1). While Defendants assert evidence as to why an individual should apply the methodologies of labor economics instead of vocational economics, it is not the Court's province to decide which is preferable. That is for the jury to decide. Instead, the Court must limit its review to its gatekeeping obligations and ensure that the testimony that will be introduced to the jury will assist it in understanding the evidence or determining a fact in issue.*

The assertion that disability worklife expectancy tables are "flawed science" is rebutted by the fact that U.S. government survey data through various worklife expectancy tables have been used successfully in thousands of disability cases over the past thirty-five plus years. A review of the literature reveals that census data are widely used by prominent disability researchers to measure the employment impact of disability. The data serve as an excellent aid to the Trier of Fact in assessing economic losses.

## Summary & Conclusions

BJR, in their chapter entitled "Worklife Expectancy Models and Concepts", provide an abbreviated academic critique of the use of worklife expectancy tables, but their presentation is barren of any literature that is supportive of the use of worklife expectancy tables. Moreover, their lack of judicial notice is troubling, since assessment of loss of earning capacity that includes consideration of worklife expectancy is crucial to a proper assessment of loss of earning capacity for a person who has lost ability to compete and work in the labor market.

We worry that the reader of the chapter in this book would be intimidated and will believe that worklife expectancy tables are not to be relied upon in a forensic setting. In fact, by calling worklife expectancy tables "flawed science at best," this appears to be their intended purpose. Chapter 20 closes with a confusing statement noting that,

*Consideration of qualitative factors (vocational clinical interview), couple with quantitative data (worklife expectancy tables) will serve to "fill the holes" and offer the trier of fact a "range of reality" versus relaying exclusively upon a homogeneous set of data to derive estimates worklife expectancy.*

It is unclear what the authors intended to be the difference between customary worklife expectancy tables and worklife expectancy tables with "qualitative factors". However, we agree that because worklife expectancy is a statistical average, exercising professional judgment is essential when defining probable worklife expectancy in years.

Worklife expectancy is specific to gender, education, age, and disability. When assessing worklife expectancy, it is important to consider these factors as they pertain specifically to the individual being assessed. For example, although males have worklife expectancies that are greater than females, a specific female may demonstrate a work pattern that is more like that of an average male of the same age and level of education than that of a female. Similarly, some males may exhibit a pattern of work that is unlike that of an average male with a similar age, education level, and disability status. The specifics of each individual must be considered when assigning worklife expectancy.

The authors of this paper know of no appellate court decision deriding the use of worklife expectancy tables in general or disability worklife tables in particular. On the other hand, a handful of appellate court decisions exist across several jurisdictions upholding the use of such tables. The study and use of worklife expectancy tables should be encouraged, not otherwise; this is all the more critical for a textbook titled *Foundations of Forensic Vocational Rehabilitation*. The alternative is to use no data when estimating an indi-

vidual's future labor force participation, and that would be speculative at best. The authors suggest that future editions of this textbook be revised to include the body of judicial decisions that have weighed on the use of worklife expectancy tables, or at the very least, to give a space to the authors who can explain the benefit of using such tables.

## References

- Barrett, G., Jayne K. A., & Robinson, R. H. (2015). Worklife expectancy models and concepts. In R. Robinson (Ed.), *Foundations of forensic vocational rehabilitation*. New York, NY: Springer.
- Cox and Tube City LLC v. Matthews*, 901 N.E.2d 14 (Ind. App. 2009).
- Gamboa, A. M., Jr., Tierney, J. P., Gibson, D. S., Clauretje, T. M., Missun, R. E., Berla, E. P., . . . Newton, J. (2009). A vocational economic rationale. *Estimating Earning Capacity: A Journal of Debate and Discussion*, 2(2), 97–123.
- Figurski v. Trinity Health-Michigan*, 2015 Mich. App. LEXIS 42 (MI 2015).
- Johnson v. CSX*, 2008 Ill. App. LEXIS 1354 (Ill. App. 2008).
- Johnson, J. R. (2001). Assessing risk in enhanced earnings valuations. *Family Law Monthly*, August.
- Misra, S., Bua-lam, P., & Majumder, R. K. (1992). A Realistic assessment of economic benefits of the rehabilitation program using Worklife Expectancy Tables. *Journal of Rehabilitation Administration*, 16(1), 15–20.
- Nilavar v. Osborn*, 137 Ohio App. 3d 469 (Ohio App. 2000)
- Knitowski v. Gundy*, 2011 N. J. Super. Unpub. LEXIS 2797 (N.J. Super. 2011).
- Reville, R. T., Seabury, S., & Neuhauser, F. (2003). *Evaluation of California's permanent disability rating schedule* (Interim report). Santa Monica, CA: RAND Corporation.
- Reville, R. T., Seabury, S., & Neuhauser, F., Burton, J.F., Greenberg, M. D. (2005). *An evaluation of California's permanent disability rating schedule*. Santa Monica, CA: RAND Corporation.
- Seabury, S. A., Reville, R. T., & Neuhauser, F. (2004). *Data for adjusting disability ratings to reflect diminished future earnings and capacity in compliance with SB 899* (Working paper). Santa Monica, CA: RAND Corporation.
- O'Shea v. Riverway Towing Company*, 677 F. 2d 1194 (1982).
- Shafer & Freeman Lakes Environmental Conservation Corporation v. Stichnoth*, 2007 Ind. App. LEXIS 2680 (Ind. App. 2007).
- Shaheen v. Advantage Moving and Storage*, 369 Ill. App. 3d 534 (Ill. App. 2006).
- U.S. Department of Labor, Office of Disability and Employment Policy (ODEP). (2017). Retrieved from <https://www.dol.gov/odep/>

## Endnotes

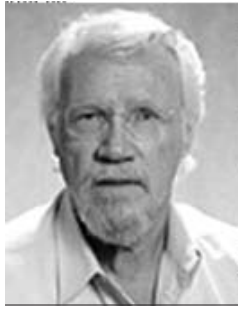
- <sup>1</sup> *O'Shea v. Riverway Towing Company*, 677 F. 2d 1194 (1982).
- <sup>2</sup> Barrett, G., Jayne K. A., & Robinson, R. H. (2015). Worklife expectancy models and concepts. In R. Robinson (Ed.), *Foundations of Forensic Vocational Rehabilitation* (p. 401). New York, NY: Springer.
- <sup>3</sup> Ibid.
- <sup>4</sup> Ibid.
- <sup>5</sup> Ibid.
- <sup>6</sup> [www.dol.gov/odep/](http://www.dol.gov/odep/) As of Dec 2016, the Labor Force Participation for people with disabilities was 20.1% and those without disabilities, 68.1%. The Unemployment Rate for people with disabilities was 9.0% and for those without disabilities, 4.3%
- <sup>7</sup> Data from the decennial Census, CPS, ACS, and SIPP can be found on the Census Bureau website at <http://www.census.gov/hhes/www/disability.html>
- <sup>8</sup> One example is a study by Stapleton et al. (1997) that accesses data from the NHIS at <http://aspe.hhs.gov/daltcp/reports/eshclit.htm>
- <sup>9</sup> <http://www.nod.org>
- <sup>10</sup> <http://www.usdoj.gov/crt/ada/adahom1.htm>
- <sup>11</sup> Gamboa, A. M., Jr., Tierney, J. P., Gibson, D. S., Clauretje, T. M., Missun, R. E., Berla, E. P., . . . Newton, J. (2009). A vocational economic rationale. *Estimating Earning Capacity: A Journal of Debate and Discussion*, 2(2), 97–123.
- <sup>12</sup> Ibid, p. 243
- <sup>13</sup> Ibid
- <sup>14</sup> Ibid, pp 415-416
- <sup>15</sup> Ibid, p. 416
- <sup>16</sup> Ibid.
- <sup>17</sup> Reville, R. T., Seabury, S., & Neuhauser, F., Burton, J.F., & Greenberg, M. D. (2005). An evaluation of California's permanent disability rating schedule. Santa Monica, CA: RAND Corporation.
- <sup>18</sup> Ibid.

### Appendix A: Appellate Court Decisions Regarding use of GGWT & ACS Worklife Data

| Case (Year)   | Court  | Summary  |
|---|--|--|
| <i>Nilavar v. Osborn</i> , 137 Ohio App. 3d 469 (Ohio App. 2000)  | Court of Appeals of Ohio                         | Rendered an opinion allowing the use of worklife expectancy tables (GGWT). The Court of Appeals accepted the decision of the trial court regarding the expert's qualifications and the accuracy of his use of the tables to determine the amount of earnings lost by the plaintiff.  |
| <i>Johnson v. CSX</i> , 2008 Ill. App. LEXIS 1354 (Ill. App. 2008).   | Appellate Court of Illinois                      | Affirmed an award to the plaintiff in the case and reaffirmed the appropriate use of ACS data in determining the amount of future earnings lost by the plaintiff.  |
| <i>Shafer &amp; Freeman Lakes Environmental Conservation Corporation v. Stichnoth</i> , 2007 Ind. App. LEXIS 2680 (Ind. App. 2007). | Court of Appeals of Indiana                      | Declined to overrule the trial judge, who had deemed the expert's use of the tables appropriate in formulating an opinion about the plaintiff's impaired future earning capacity.  |
| <i>Shaheen v. Advantage Moving and Storage</i> , 369 Ill. App. 3d 534 (Ill. App. 2006).   | Appellate Court of Illinois                      | Denied the defense motion and allowed the use of the tables (GGWT). The defense did not object to the vocational expert's use of the tables or methodology, but rather to the fact that the expert did not give weight to the fact that the plaintiff earned more the year after the accident than the year before the accident. The appellate court indicated that they could not conclude that the trial court abused its discretion in this case. |
| <i>Cox and Tube City LLC v. Matthews</i> , 901 N.E.2d 14 (Ind. App. 2009).  | Court of Appeals of Indiana                      | Defendants argued that the vocational expert's testimony regarding the plaintiff's decreased worklife did not relate to the specific case and lacked a foundation because a doctor did not testify that the plaintiff had a reduction in worklife. The trial court did not agree, and the Court of Appeals of Indiana affirmed the trial court decision.   |
| <i>Knitowski v. Gundy</i> , 2011 N. J. Super. Unpub. LEXIS 2797 (N.J. Super. 2011).   | Superior Court of New Jersey, Appellate Division | Affirmed the trial court's decision allowing the expert's testimony based on worklife expectancy tables for disabled individuals. The judge concluded that the plaintiff's reduced worklife expectancy was based upon an accepted methodology and reliable data. It is interesting to note that in this case, the plaintiff earned more postinjury than he did preinjury.  |
| <i>Figurski v. Trinity Health-Michigan</i> , 2015 Mich. App. LEXIS 42 (MI 2015).  | Michigan Court of Appeals                        | Agreed with the trial court's decision allowing the expert's testimony regarding future wage loss under the five step methodology of defining: preinjury annual earning capacity, preinjury worklife expectancy, postinjury annual earning capacity, postinjury worklife expectancy, and a present value calculation of the loss.  |







### **In Memoriam**

Dr. Amos Sales was born November 6, 1941, in Red River CO., Texas. Died on June 25, 2016 in Plano, TX. Dr. Sales received his BS and MS at the University of AZ. He attended the University of Florida, Gainesville, FL, to complete his EdD in Counselor Education in May, 1971. Dr. Sales held academic and administrative appointments at Emporia State University prior to joining the Department of Rehabilitation

at the University of AZ. He became Director of the Rehabilitation Program at the University of AZ in 1977 and held that position until his retirement in 2012.

During his lengthy career, Dr. Sales received over 40 citations, certificates, and awards. He was a Past-President of both the National Rehabilitation Association and the National Council on Rehabilitation Education (NCRE). He received the NCRE's Distinguished Career Award, the Dept. of Education's RSA Commissioner's Award for distinguished achievement and distinction in Rehab Education, the National Counselor and Educator Associations Living Legend Award and the American Counseling Association's Ralph Berdie Research Award. Dr. Sales was a Switzer Scholar. He served on two RSA Institute on Rehabilitation Issues Study groups and was appointed to the Advisory Board of the 2008 RSA national study. Dr. Sales most recent national service was as Co-Chair of the CORE Committee on Standards Review.

More importantly, Dr. Sales maintained a passion for teaching and for recruiting others into the field of Rehabilitation. He specialized in facilitating master's and doctoral learning of counseling skills.

He will be greatly missed.



# The Rehabilitation Professional

The Rehabilitation Professional is published quarterly by the International Association of Rehabilitation Professionals (IARP). The Rehabilitation Professional is published to promote the profession and to inform the public about the activities of the organizations and their affiliates.

The Rehabilitation Professional is distributed to all IARP members as a benefit of membership and is available through subscription. Circulation of others is through various promotions.

## **IARP Headquarters:**

1000 Westgate Drive, #252  
St. Paul, MN 55114  
888-IARPQaA (888-427-7722)  
webpage: <http://www.rehabpro.org>

## **Executive Director:**

Kris Haski, [krish@rehabpro.org](mailto:krish@rehabpro.org)

## **Director of Member and Chapter Services:**

Dale Regnier, [daler@rehabpro.org](mailto:daler@rehabpro.org)

## **Director of Meetings:**

Erin Babarskis, [erinb@rehabpro.org](mailto:erinb@rehabpro.org)

## **Communications Manager:**

Mohammad Gulam, [mohammadg@rehabpro.org](mailto:mohammadg@rehabpro.org)

## **Professional Development:**

Julie Renner, [juliar@ewald.com](mailto:juliar@ewald.com)

## **Sales Manager:**

Sarah Ewald, [sarahe@ewald.com](mailto:sarahe@ewald.com)

## **Editor:**

T. Scott Smith, [tss1065@louisiana.edu](mailto:tss1065@louisiana.edu)

## **Managing Editor:**

Wesley A. Austin, [waustin@louisiana.edu](mailto:waustin@louisiana.edu)

**Rights and Permissions:** ©2017 IARP. Printed in U.S.A. No part of this publication may be reprinted or reproduced in any form or by any means, electronic or mechanical, including photocopying, recording, or by any electronic storage and retrieval system without permission in writing from the publisher.

Articles in this publication reflect the opinion of the authors and do not necessarily represent the official views of IARP.

**Manuscript Submission Deadlines:** Deadlines for submissions are February 5, May 5, August 5 and November 5 with publication goal dates of February, May, August and November. There is no guaranteed publication date for an accepted article.

## **Credits:**

Design & Production: Janet Field  
Printing: Athens Printing Company, Athens, GA

## **Publication Guidelines**

The Rehabilitation Professional (RehabPro) is the quarterly publication of the International Association of Rehabilitation Professionals (IARP). The articles are written with the rehabilitation professional in mind. Articles are suggested for, but not limited to, the following tracks: case management, disability management, forensic/life care planning, and business development. The articles are reviewed by the Managing Editor and may be reviewed by members of the Rehab Pro Committee.

Author(s) should follow the most recent edition of the Publication Manual of the American Psychological Association. The names and mailing addresses of the authors should be included so that a complimentary copy of the Rehab Pro can be sent in appreciation.

Articles should be in Microsoft Word format, using Times Roman font, and be double-spaced. Tables need not be camera ready since they are reset to match the style of the journal. Tables should be located at the end of the document. Graphs and figures should be included as separate files and be in a graphic format, e.g., JPG, TIF. Contact the Managing Editor for instructions for sending photographs. Articles should be sent to the Managing Editor as an email attachment.

Abstracts of no more than 120 words each should be included. The abstract should include a brief summary of the content of the article. Author notes should conform to current APA 6th edition format.

Authors should use acceptable language, which respects individuals. Non-sexist and gender neutral language should be used. Also, language that equates the individual with his or her disability should be avoided. For example, "a person with a learning disability" should be used instead of "the learning disabled."

Upon review, an article is either accepted or rejected. Accepted articles often require editing for spelling and grammar. These are done without contacting the authors. Authors will be contacted, however, if there are questions about the meaning of the content or if significant changes are needed to syntax. Articles are usually published in the order received.

## **General Instructions:**

1. Type all copy as upper and lower case. Do not use all capitals or all small letters.
2. Indicate correct location of tables and figures in text, enclosed in angle brackets.  
Example: **<Insert Table 1 approximately here>**
3. Remove all hyperlinks.
4. Do not use the tab key or spaces to align text.
5. Only one space should follow any punctuation. Do not include additional spaces at the end of the paragraph.
6. Authors are responsible for accuracy of spelling.



The Course of a Lifetime Starts with IARP