

The Primacy of Model Design Over Application: A Response to “The Importance of *Statistically* Measured Worklife Expectancy”

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This post-publication critique of “The Importance of *Statistically Measured Worklife Expectancy*” (Crouse, 2020), which appeared in this journal, brings to light some inaccuracies and misleading statements regarding the use of disability-related data from the U.S. Census Bureau’s American Community Survey. The subject article proposes a model using Census data to derive exact reductions in worklife years for a permanently injured individual. Crouse illustrates the concept using four case studies, but does not sufficiently address the model’s design, theoretical foundation, or limitations. Evaluation of the model’s validity should be emphasized over its potential applications.

Keywords: disability, worklife, Census, American Community Survey, model, validity, case studies

As scientific knowledge is built upon prior scientific knowledge, it is important that each layer has solid foundation and can support the additional research from which scholarship advances. Unfortunately, “The Importance of *Statistically Measured Worklife Expectancy*” (Crouse, 2020), recently published by this journal, contains inaccuracies and misleading statements. Further, it does not state a theoretical framework for its proposed model; presents ideas as facts, without citation; and does not indicate the model’s limitations.

The Model, Generally

Although practitioners may be drawn to the four case examples, which are presented in some detail in the second half of the subject article, it is first wise to understand and evaluate the model being proposed, along with its theoretical foundation, assumptions, and limitations. In general, the model uses population survey data to predict the number of years an individual will work, particularly post-accident. Using the life-participation-employment (LPE) method,¹ statistical worklife expectancy is calculated for two populations: nondisabled persons and disabled persons. Then, those worklife figures are used to predict the reduction in worklife years expected for an individual with a permanent injury, theorizing that but for the injury the individual would have realized the average worklife of the nondisabled population, and due to the injury they will realize the average worklife of the disabled population. The population data for both nondisabled and disabled categories are stratified by age, sex, and educational level; data from disabled respondents are separated by functional impairment.

Before addressing the author’s proposed model in more detail, it is helpful to unpack the primary data source for the worklife estimates, the American Community Survey (ACS),² in particular the six survey questions addressing functional impairments and therefore potential disability.

American Community Survey and “Disability”

Since the central focus of the subject article is the application of ACS data ostensibly reflecting disability, it is crucial to have an accurate understanding of what the survey data signify. Since 2008 the ACS has contained the same six survey questions pertaining to potential disability. The questions were a change from earlier ACS designs, intended to reflect updated models of disability, and to identify “*limitations* [emphasis added] in the four basic areas of functioning (vision, hearing, mobility, and cognitive functioning), as well as self-care, and independent living” (U.S. Census Bureau, n.d.). These six questions, verbatim from the ACS questionnaire, are set forth in Table 1. Each question asks about “difficulty” and allows for a binary “yes” or “no” response.

Table 1

Six ACS Questions Regarding Possible Disability

Question #	Question
17 a.	Is this person deaf or does he/she have serious difficulty hearing?
17 b.	Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?
18 a.	Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?
18 b.	Does this person have serious difficulty walking or climbing stairs?
18 c.	Does this person have difficulty dressing or bathing?
19	Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor’s office or shopping?

Note. From “The American Community Survey” questionnaire, 2017.

The subject article makes a number of incorrect assertions concerning the ACS definitions related to these questions, including:

From 2008 to present, the ACS has defined cognitive and mobility disabilities as follows. Persons are defined as having a cognitive disability if they are identified as having difficulty remembering, concentrating, or making decisions because of a physical, mental, or emotional condition lasting 6 months or more. Persons are defined as having a mobility disability if they are identified as having serious difficulty walking or climbing stairs. (Crouse, 2020, p. 29)

First, stating the ACS definitions this way is misleading. The technical documentation for the ACS clarifies that a respondent’s “yes” answer to one of the disability status questions does *not* equate to “disability,” as follows:

Under the conceptual framework of disability described by the Institute of Medicine (IOM) and the International Classification of Functioning, Disability, and Health (ICF), disability is defined as the product of interactions among individuals’ bodies; their physical, emotional, and mental health; and the physical and social environment in which they live, work, or play.... Measuring this complex concept of disability with a short set of six questions is difficult.... People identified by the ACS as having a disability are, in fact, those who exhibit difficulty with specific functions and *may* [emphasis added], in the absence of accommodation, have a disability. (U.S. Census Bureau, 2018, pp. 59–60)

As Altman (2014) points out, this focus on functioning identifies the *risk* of disability, rather than disability per se. Using ACS data and adopting it as reflecting “disability” for purposes of commentary or data analysis, as some disability researchers have done with explanation, is very different from misstating definitions and attributing them to the ACS itself. If Crouse believes that ACS responses may

be used as proxies for work disability status in his model, then a journal article is an excellent place to present arguments and evidence to support that approach. Unfortunately, the subject article avoids that justification by misstating the definitions of the underlying concepts.

Second, the temporal qualifier “lasting 6 months or more” as presented in the article’s supposed ACS definition of cognitive disability is inaccurate, since question 18a contains no language mentioning duration. Duration times have not been included in any of these six ACS questions for more than a decade (Brault, 2009). The error is repeated in two of the article’s case studies,³ where the mistakenly attributed “ACS definition” of cognitive disability again includes the phrase “lasting 6 months or more.”⁴

Third, these problems are compounded by the article’s implication that disability *severity* is presented in the ACS data, which is untrue. After the author presents his version of ACS definitions in the second paragraph on page 29, this sentence appears next: “A severe disability exists when an individual reports difficulty with self-care or going outside the home alone.” No citation is offered for this concept, and no qualifying language is used,⁵ which may leave readers with the impression that the ACS somehow defines disability severity in this way. This is cemented later when, in the fourth case example, the article states more explicitly: “Ms. Smith meets the *ACS definition* [emphasis added] of a non-severe mobility disability” (p. 34). But there is no such ACS definition; the ACS questions do not address the severity spectrum at all, other than by using the word “serious” in the first four questions. When the author writes “a severe disability exists when,” he is stating a theory and positioning it as a fact. The article should make clear that linking responses from different ACS questions in order to infer severity of a particular functional impairment or disability is part of the model being proposed, and then present argument, citations, and/or data to support that concept.⁶

Also problematic is the article’s representation, occurring multiple times, that a particular worklife expectancy estimate, whether pre-injury or post-injury, is “ACS worklife expectancy” (p. 29) or that it is worklife “according to the American Community Survey” (p. 32). This is misleading because the ACS results do not contain worklife expectancy figures. Such a misrepresentation could add a degree of credibility, inappropriately, to the perception of the model’s reliability. More accurately, and as the subject article does explain elsewhere, the model *uses* ACS responses, along with other data from the United States Life Tables, to *calculate* worklife expectancies using the LPE method it defines; this is quite different from the verbiage quoted above. Perhaps the author chose a shorthand, assuming the audience’s base knowledge was strong enough to understand the true distinctions, but here such abridged language is misleading.

The Model, More Specifically

When devoting one-half of the text to case study applications of the proposed disability worklife model, the article gets ahead of itself. Prior to illustrating how a model can be used, one must consider the validity of the model itself. And yet there are no citations, and scant explanation, addressing the design, theories, assumptions, and testing underlying this model being presented in a peer-reviewed professional journal. Absent establishing the model’s validity and reliability,⁷ and addressing at least briefly its limitations, how can the case studies be used effectively? Missing is the professional scholarship that a journal article can provide – an analysis of and support for the underpinnings of the model itself.

Limitations of the Model

Although limitations to inferences are unavoidable in the social sciences, they should nonetheless be acknowledged in scholarly work.⁸ The subject article does not communicate the proposed model’s various limitations. As explained earlier, the ACS data represent people at risk of disability, rather than people who are injury-disabled. This problem is heightened when one considers that the model lacks data on *work* disability, which is the focus of vocational analysis and attendant economic damages calculations. The ACS questions reproduced in Table 1 ask about the presence of “difficulty” but,

aside from question 19,⁹ they do not inquire about any effect the difficulty has, and do not distinguish among the social, physical, or work environments where disability might exist. This problem is significant since, as Gibson (2001) points out, “a disability that limits a person’s social or family activities, but not the ability to work, is of no importance for assessing worklife expectancy” (p. 8). The subject article acknowledges that the plaintiff’s “impairment must translate into some limitation associated with performing work” (p. 30), but it does not offer support for the proposed direct conceptual link between the impact of an individual’s work limitation and ACS quantitative data which do not consider work at all. In addition, research in multiple disciplines has demonstrated that the ACS questions do *not* in fact reflect permanent disability,¹⁰ yet the proposed model and the case studies assume permanent disability.

Kruse and Schur (2003) summarize the issues just described, especially when one considers their use of “substantial” as echoic of the qualifier “serious” from the ACS questions:

The variety of impairments, skills, personal characteristics, and environments in which major life activities are performed, and the question of whether limitations are “substantial,” leave room for considerable ambiguity over who has a disability. Estimating employment trends is further complicated by the fact that disability is a fairly fluid category; not only do people’s medical conditions deteriorate or improve, but environments and life circumstances change in ways that affect disability.¹¹ (p. 283)

Other, Less Significant Problems

The problems identified in this section would not have been, even if taken together, sufficient to generate a formal response such as this one. They are described here briefly to support a call for additional scrutiny.

Crouse’s article defines earning capacity as: “the sum total of what one brings to the marketplace cognitively and physically” (p. 27). But this incomplete definition omits the vital role of *demand* in the labor market. As explained by Horner and Slesnick (1999):

The demand side focuses upon how many jobs employers would offer for a given level of vocational capacity at various wage levels.... Definitions of earning capacity that address only the *ability* of the person to *perform* a given job... [ignore] the possibility that the person actually can get such a job, and, thus, it is the *vocational* capacity rather than the *earning* capacity that has been examined. (pp. 23–24)

Statistical results are presented without information on sample size. Curiously, the article appears to draw heavily from the Vocational Economic Rationale (2009),¹² but does not cite it.

The article lacks a meaningful literature review, other than a paragraph in the “Alternative Approaches” closing section. Absent is any discussion of relevant articles, many critical, published in multiple journals including this one, concerning use of U.S. Census survey data pertaining to disability.¹³ A conventional literature review would address those critiques, or reference past articles addressing them, and may have provided extended foundation for the model as offered. Indeed, a literature review is a required element when proposing a model, since “building your research on and relating it to existing knowledge is the building block of all academic research activities, regardless of discipline” (Snyder, 2019, p. 333).

Conclusion

The Rehabilitation Professional encourages readers to “look to this authoritative and well-respected publication to maintain a professional edge” (IARP, 2020). Particularly to those working in the litigation or valuation arenas, publication of research or a model in a double-blind refereed journal can carry significant meaning.¹⁴ However, for the subject article the pre-publication process falls short.

The author is proposing a model to quantify the reduction in worklife that can be expected for a permanently injured plaintiff, and the case studies imply that he is already using the model in practice. But submitting that model for peer review, and having it accepted for publication, is different from private use. Controversy exists around the use of Census disability data and thus more scrutiny would be well-advised.

Choosing a reasonably compact title for a work which aims to delineate complex ideas is a tough task, but in this case the uncontroversial title – yes, all would agree that worklife expectancy can be measured statistically – does not hint at the core proposition: that broad categories of functional impairments may be used as part of a valid and reliable method to derive precise statistical worklife expectancy reduction for a permanently injured individual. Prior studies indicate that the disabled, when taken as a group, experience lower labor force participation, lower employment, and lower earnings (Kang, Dunn, & Blank, 2018; Krause et al., 2018); this response should not be construed as disputing those studies. But “The Importance of *Statistically* Measured Worklife Expectancy” contains material errors and inconsistencies, and presents a model without the necessary foundation, leaving many key questions unanswered.

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Endnotes

- ¹ This method is described in detail in Barrett, Jayne, and Robinson (2014, pp. 406–415).
- ² This large-scale mandatory survey is conducted annually by the U.S. Census Bureau.
- ³ Case Example 1 (p. 31) and Case Example 3 (p. 33).
- ⁴ Not only are the definitions inaccurate as presented, but since the numeric estimates for cognitive disability presented in Crouse's Tables 1 – 4 are apparently based on post-2007 ACS data, the claimed definitions are also not applicable to those tables.
- ⁵ For example, phrasing such as “this model assumes” or “it is the author’s opinion.”
- ⁶ Severity is inferred in some Census Bureau analyses using Survey of Income and Program Participation data and also Current Population Survey data, although not with methods resembling the one suggested by the subject article.
- ⁷ Note the critical distinction between validity or reliability of the underlying ACS data, and validity or reliability of the model itself, or how the ACS data are being used. This response focuses on the latter.
- ⁸ For general examples of research limitations, see Price and Murnan (2004).
- ⁹ Question 19 appears to be used only in the model’s conception of severity, and not as an indicator of “disability” itself.
- ¹⁰ From public health, see Ward et al. (2017); from forensic economics, see Krueger and Skoog (2015); and from vocational rehabilitation, see Beveridge and Durant (2017).

¹¹ Kruse and Schur take “substantial” from the language of the Americans With Disabilities Act.

¹² The Vocational Economic Rationale method has been copyrighted by Vocational Economics, Inc. and a version was published in 2009 (Gamboa, et al.) as an invited paper; per the journal’s editor at the time, it did not undergo a blind peer-review process (T. F. Field, personal communication, March 9, 2016). According to Crouse (2015), the method has been updated and copyrighted routinely, at least through 2014.

¹³ For example, see Ireland (2009) along with its reference list, and Gamboa (2009), both in this journal, as well as this journal’s special issue devoted to worklife expectancy (Field, 2018).

¹⁴ For an interesting exposition of peer review, both broadly conceived and as used here (i.e., pre-publication blind review), as relating to litigation and expert opinions, see Haack (2007).

Author Notes

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