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## **Vocational Factors in the Social Security Disability Determination Process: A Literature Review**

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## **ABSTRACT**

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At the request of the Social Security Administration (SSA), Mathematica Policy Research conducted a literature review to inform policy discussion about how the disability determination process for the Social Security Disability Insurance and Supplemental Security Income programs incorporates consideration of the vocational factors—that is, age, education, and work experience. Specifically, we sought to identify and evaluate existing literature, reports, and studies that could directly support evidence-based conclusions about the following research question: to what extent do age, education, and work experience affect a person’s ability to perform work he or she has not performed before, independent of all other factors, such as health, impairments and limitations, motivation, or general labor market conditions? This research question, developed in consultation with SSA, is narrow in scope and reflects both statutory language about the vocational factors and how SSA currently incorporates them into the disability determination process.

Our principal finding is that no rigorous evidence directly supports how the disability determination process currently uses vocational factors or how the disability determination process could change their future use. Although we found extensive documentation of relationships between the vocational factors and the extent to which people actually work or perform work-related activities, the documentation does not distinguish between the effects of the vocational factors on the ability to perform new work and the many other potential causes of the observed relationships. We identified only two articles that contained information tangentially relevant to the research question.

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## EXECUTIVE SUMMARY

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Growth in Social Security Disability Insurance (DI) and Supplemental Security Income (SSI) caseloads has generated policy interest in reforms that reduce growth in program expenditures. The aim of this paper is to inform discussions of one approach to slowing growth in program expenditures: revisions to the consideration of the vocational factors—that is, age, education, and work experience—in the DI and SSI disability determination process. The Social Security Administration (SSA) administers both programs, and state Disability Determination Services perform initial disability determinations for medical eligibility under SSA’s sponsorship and oversight.

Adjudicators use the vocational factors in the final step of a five-step sequential disability determination process. Before Step 5, the adjudicator has determined that the applicant is financially eligible for benefits, has a condition or conditions that interfere with the ability to perform substantive work, does not have a condition that meets a list of conditions considered severe enough to warrant eligibility for benefits, and cannot perform any substantive work he or she performed before in the vocationally relevant period. At Step 5, the adjudicator determines whether the applicant has the ability, based on the applicant’s residual functional capacity and the vocational factors, to work substantively at a job the applicant has not performed before. SSA has regulatory guidelines—the Medical-Vocational Guidelines—for determining whether an applicant has the ability to adapt to new work. By statute, SSA can consider only the vocational factors of age, education, and work experience during the disability determination process. In 2010, 42.8 percent of financially eligible DI applicants had their eligibility determination made at Step 5.

At SSA’s request, Mathematica Policy Research conducted a literature review to inform policy discussion about how SSA incorporates the consideration of the vocational factors into the disability determination process. We sought to identify and evaluate existing literature, reports, and studies that could facilitate evidence-based conclusions about the following research question: *to what extent do age, education, and work experience affect a person’s ability to perform work he or she has not performed before, independent of all other factors, such as health, impairments and limitations, motivation, or general labor market conditions?* This research question, developed in consultation with SSA, is narrow in scope and reflects both statutory language about the vocational factors and how SSA currently incorporates them into the disability determination process.

We anticipated this literature review would be challenging, because the research question required finding studies and reports that isolated quite narrow effects. We anticipated finding many studies that examine relationships between the vocational factors and employment, such as how employment rates vary by age, highest degree completed, or years in the labor force. However, our research question was much narrower than examining such relationships. For instance, the phrase *ability to perform work* in the research question references whether someone can work, not whether someone is working, and the phrase *he or she has not performed before* confined the search to studies examining work that a person has not recently performed. Hence, only studies that examined whether someone can perform work they have never performed before were relevant to our search.

After SSA reviewed and approved the search plan, we conducted the literature search using sophisticated, well-tested electronic methods. We searched eight major bibliographic databases and search engines that cover employment-related topics, plus three databases that catalogue so-called grey literature, such as reports and documents published by the government or that have not undergone peer review by a third party. Trained staff screened all search results to identify articles potentially relevant to the research question. The searches identified and our staff reviewed 2,320 peer-reviewed articles.

The main finding is that, although many studies examine the relationship between the vocational factors and employment, we were unable to find articles that directly addressed any aspect of the research question. That is, we found no rigorous evidence of the independent effects of age, education, and work experience on the ability to perform new work. We identified only two articles that contained information tangentially relevant to the research question. Our findings are consistent with the past record of reviews of the evidence on this topic. Past studies have found evidence that address questions of indirect relevance to the use of the vocational factors, but it is unreasonable to expect such studies to provide a strong foundation for changes in the consideration of the vocational factors in the disability determination process.

## I. INTRODUCTION

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The Social Security Administration (SSA) administers the United States' largest income support programs for people with disabilities: Social Security Disability Insurance (DI) and Supplemental Security Income (SSI). DI is the disability component of the larger Old-Age, Survivors, and Disability Insurance wage replacement insurance program; workers must have sufficient earnings history in covered employment to be eligible. SSI is a means-tested program that provides income support payments to working-age adults with disabilities and very low income and assets, as well as to low-income people in two other populations (children with disabilities and people ages 65 and older).

Growth in the number of DI and SSI beneficiaries and the projected 2016 exhaustion of the DI Trust Fund (Social Security Administration 2014a) have prompted consideration of options for reducing growth in program expenditures, as well as increasing Trust Fund revenues. This paper aims to inform discussions of one approach to slowing growth in program expenditures: revisions to the consideration of the vocational factors—that is, age, education, and work experience—in the disability determination process. The vocational factors play an important role in allowances made to DI and SSI applicants.

Both DI and SSI caseloads have grown substantially in recent decades, increasing program costs. The number of disabled workers and their dependents increased from 4.7 million in December 1980 to 11.0 million in December 2013 (Social Security Administration 2014b). In nominal dollars, annual DI benefit payments grew from \$15.4 billion in 1980 to \$140.1 billion in 2013 (Social Security Administration 2014c). Similarly, the SSI disabled adult caseload increased from 2.0 million in December 1980 to 5.6 million in December 2012. SSI disabled adult benefit payments increased in nominal dollars from \$3.7 billion in 1980 to \$36.9 billion in 2012 (Social Security Administration 2013). General revenues finance SSI payments.

SSA determines eligibility of adult applicants to both programs using a five-step sequential process. For applications who reach the final step of the disability determination process, SSA considers how the applicant's residual functional capacity (RFC)—maximum remaining capacity for work on a sustained basis—and vocational factors affect the applicant's ability to perform work that the applicant has not recently (or ever) performed. SSA considers only the vocational factors of age, education, and work experience in the disability determination process because statute states that an applicant "... shall be determined to be under a disability only if his physical or mental impairment or impairments are of such severity that he is not only unable to do his previous work but cannot, considering his age, education, and work experience, engage in any kind of substantial gainful work which exists in the national economy...."<sup>1</sup> Among applicants determined to be financially eligible for benefits, 42.8 percent of initial DI application decisions and 46.7 percent of initial adult SSI application decisions in 2010 were made at the final step (Wixon and Strand 2013). A substantial proportion of DI and SSI applications reach the step in which the vocational factors are considered. Therefore, changes to consideration of the vocational factors in the disability determination process could have important implications for DI and SSI caseload and expenditure growth.

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<sup>1</sup> Section 223(d) of the Social Security Act, 47 U.S.C. § 423(d)(2)(A).

Interest has grown in changing the consideration of the vocational factors in the disability determination process. In 2005 SSA published a notice of proposed rulemaking (NPRM) for changes that would have increased the minimum and maximum ages of each of the four age categories used in the vocational factors by two years, in line with the two-year increase in the full retirement age (FRA) that is already in process. SSA pointed out in the 2005 NPRM there were “no conclusive data which relate varying specific chronologi[c]al ages to specific physiologically based vocational limitations for performing jobs” when the rules were first implemented in 1978 (SSA 2005). Further, the lack of rigorous evidence to support the proposed rule change generated substantial public criticism and the proposal was eventually withdrawn. More recently, the Congressional Budget Office (2012) scored a proposal to generate greater DI program savings: a two-year increase in the upper and lower age limits for the two lowest age categories, a two-year increase in the minimum age for the third age category, an increase in the maximum age of the third category to the FRA, and elimination of the top category.

This report seeks to inform policy discussion about how the disability determination process, in a limited way, incorporates consideration of vocational factors. Specifically, at SSA’s request we conducted an exhaustive literature search to find rigorous evidence of the sort that SSA had determined was lacking in 2005. That is, we searched for rigorous evidence regarding how only age, education, and work experience affect a person’s ability to perform substantial work that he or she has not previously performed. Such research is consistent with both the language about vocational factors in the statute and how SSA applies the vocational factors in the eligibility process. It is important to recognize that the effect of the vocational factors on the ability to perform new work is distinct from the effect of these factors on the willingness of workers to work or the willingness of employers to hire them.

Our principal finding is consistent with SSA’s previous conclusion: no rigorous evidence directly supports how the disability determination process currently uses the vocational factors or supports changes in their future use. This is because no researchers have rigorously studied the effect of the vocational factors on employment in a way that is consistent with how the SSA disability determination process applies them. Despite finding more than 2,300 articles in the databases with potentially relevant concepts and terms, we identified just 2 articles that contained information tangentially relevant to how SSA applies the vocational factors to the disability determination process. There is extensive documentation of relationships between the vocational factors and the extent to which people actually work or perform work-related activities; however, this documentation does not distinguish between the effects of the vocational factors on the ability to perform new work and the many other potential causes of the observed relationships. An expanded literature review that looks for research on tangential questions could potentially identify indirect support for use of the vocational factors in the determination process.

Section II of this report provides background information on SSA’s disability determination process. In Section III, we present the research question. Section IV describes how we conducted the search. In Section V, we present the findings, and in Section VI, we discuss the findings’ implications.

## II. BACKGROUND

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In this section, we outline SSA’s disability determination process and the vocational factors’ role in that process. Understanding the current role of the vocational factors in the disability determination process is critical to this literature review, because SSA developed the research question, which we present in the next chapter, to inform discussion about potential changes to how SSA incorporates consideration of the vocational factors into the disability determination process. We first outline the entire disability determination process, then describe in greater detail the final step of the process, which incorporates the consideration of vocational factors.

### A. Disability determination five-step process

SSA establishes applicants’ medical eligibility for DI or SSI benefits by determining whether applicants’ circumstances meet the statutory disability definition. The common medical eligibility criteria for both programs is designed to conform to the definition of disability in Section 223(d) of the Social Security Act, 42 U.S.C. § 423(d)(1)(A): “... inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months....” In most circumstances, an SSA field office takes the initial claim and adjudicates technical (that is, nonmedical) eligibility. A state Disability Determination Service (DDS) conducts the initial medical determinations, under SSA’s supervision. Except in states that have adopted the Disability Redesign Prototype, the DDS also conducts the first review of appealed denials.<sup>2</sup> Higher-level appeals for all claimants are adjudicated by SSA’s Office of Disability Adjudication and Review and, ultimately, by U.S. District Courts.

The adjudicators of medical eligibility at every level use a five-step, sequential evaluation process. This process aims to make straightforward determination decisions at early steps and leave the more complicated, resource-intensive decisions for later steps. At Step 1, the adjudicator determines whether the applicant is currently engaged in substantial gainful activity (SGA)—defined in 2014 as the equivalent of being able to earn \$1,070 a month for those who are not blind, or \$1,800 for those who are blind. Those engaging in SGA are not considered disabled for program eligibility purposes. At Step 2, the adjudicator determines whether a person’s condition interferes with his or her ability to perform basic work activities and will likely last at least 12 continuous months or result in death. If the application is not denied at Steps 1 or 2, the adjudicator proceeds to Step 3. In this step, the adjudicator compares an applicant’s condition to SSA’s Listing of Impairments—a list of medical conditions considered severe enough to warrant eligibility for benefits. If the adjudicator determines that the applicant’s condition “meets or equals the Listings” (is in the list or is not in the list but is equivalent in severity), the applicant is determined to be medically eligible.

For those not determined eligible at Step 3, the adjudicator proceeds to Step 4. At this step, the adjudicator assesses whether the applicant, given his or her RFC, can perform SGA-level work that he or she has performed in the vocationally relevant period (any time in the previous

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<sup>2</sup> The Disability Redesign Prototype states are Alabama, Alaska, California, Colorado, Louisiana, Michigan, Missouri, New Hampshire, New York, and Pennsylvania.

15 years); if so, the adjudicator denies the application. If not, the adjudicator moves to Step 5, the final step. The adjudicator determines whether the applicant has the ability, based on the applicant's RFC and vocational factors, to adapt to new work—that is, work at the SGA level that the applicant has not performed before. Applicants are determined to be medically eligible if unable to adapt to any jobs that exist in significant numbers in the national economy.<sup>3</sup>

Wixon and Strand (2013) present statistics on the percentage of 2010 DDS disability determinations made at each step of the sequential evaluation process, by program title. All applications sent to a DDS for review have passed Step 1 of the sequential process. For DI, 15.8 percent of DDS determinations resulted in a denial at Step 2 because their impairment was not severe. At Step 3, another 13.6 of applicants were found to be medically eligible because their condition met or equaled the Listings. The rest (nearly 64 percent of these cases) reached Step 4, resulting in the denial of 20.5 percent at this step. The remaining 42.8 percent reached Step 5: at that step, 16.8 were determined to be medically eligible, and 26.0 percent were determined to be ineligible.<sup>4</sup>

## **B. Step 5 Grid Rules**

The law requires SSA to consider vocational factors in the disability determination process, stating:

“...an individual shall be determined to be under a disability only if his physical or mental impairment or impairments are of such severity that he is not only unable to do his previous work but cannot, considering his age, education, and work experience, engage in any other kind of substantial gainful work which exists in the national economy, regardless of whether such work exists in the immediate area in which he lives, or whether a specific job vacancy exists for him, or whether he would be hired if he applied for work.”<sup>5</sup>

SSA has regulatory guidelines for determining whether an applicant who has reached Step 5 has the ability to adapt to new work. SSA uses its Medical-Vocational Guidelines—often referred to as the Vocational Grid, Grids, or Grid Rules—to assess an applicant's ability to adapt to new work conditional on the applicant's RFC, age, education, and work experience. The lower the RFC, the higher the age, the lower the education, and the lower the level of experience, the more likely the adjudicator will determine that the applicant is disabled. If SSA applies the Grid Rules and determines the applicant is ineligible, SSA typically provides the applicant with (1) a list of three or more occupations that the applicant should be able to perform, or (2) a previous Social Security ruling that supports the denial of the applicant's claim. The *Federal Register* introduced the Grid Rules in 1978, and they have not changed since then.

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<sup>3</sup> We adapted this outline of the five-step process from a summary provided by Wixon and Strand (2013).

<sup>4</sup> More than seven percent (7.4 percent) of DI applicants considered at the DDS level in 2010 had a disability determination made “in between” the sequential evaluation steps. Nearly all (7.1 percent) of these decisions were denials and usually involved failures or refusals by applicants to submit evidence needed for the determination.

<sup>5</sup> Section 1614(a) of the Social Security Act, 42 U.S.C. § 1382c(a)(3)(B).

The disability determination process defines two limitation types—exertional and nonexertional—that play an important role in the application of the Grid Rules. SSA defines an exertional limitation as “an impairment-related limitation that reduces the capacity to sit, stand, walk, lift, carry, push, or pull” (Social Security Administration 2014d). It considers all other limitations nonexertional limitations.<sup>6</sup> If an applicant has exertional limitations only or both exertional and nonexertional limitations, and the exertional limitations alone are sufficient to support a finding of disabled, either the eligibility determination is made by directly applying the relevant rule or, if the limitation falls between two rules or the range of low RFC cannot be approximated, a vocational specialist is consulted to help make the decision. However, if an applicant has either nonexertional limitations only or both exertional and nonexertional limitations, but the exertional limitations alone are insufficient to support a finding of disabled, the Grid Rules are not directly applied; instead, they are used as a framework along with the definitions and discussions in the text of the regulations.

SSA categorizes an applicant’s RFC, age, education, and work experience before applying a rule. The RFC categories are (from highest to lowest) an ability to do work that is very heavy, heavy, medium, light, and sedentary.<sup>7,8</sup> The age categories are advanced age (ages 55 or older), closely approaching advanced age (ages 50 to 54), and younger individual (younger than age 50). There are also two age subcategories: younger individuals ages 45 to 49 and those closely approaching retirement age (age 60 or older). The education categories include (1) illiterate or unable to communicate in English, (2) marginal education (completed formal schooling through the 6th grade), (3) limited education (completed formal schooling from the 7th grade through the 11th grade), (4) high school education or above, or (5) recent education that provides for direct entry into skilled work. The work experience categories include unskilled or none; skilled or semiskilled, not transferable; and skilled or semiskilled, transferable. The Specific Vocational Preparation from the Dictionary of Occupational Titles forms the basis of the work experience categories.

Step 5 adjudications involving nonexertional limitations—which are the majority of cases that reach this step—use the Grid Rules as a framework for making medical eligibility determinations. When an applicant has exertional and nonexertional limitations, but the exertional limitations alone are insufficient to support a finding of disabled, the additional effects of the nonexertional limitations are considered. The adjudicator assesses the extent to which the nonexertional limitations erode the applicant’s remaining occupational base—the occupations that the applicant can still perform given his or her RFC category, age, education, and work experience. If the occupational base erosion is more than minimal, then the adjudicator considers nonexertional limitations as part of the vocational profile when making the eligibility decision. However, if an applicant has nonexertional limitations only, then the case is adjudicated using

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<sup>6</sup> Examples of nonexertional limitations are cognitive limitations, sensory limitations, job requirement restrictions (such as an inability to tolerate fumes or dust), and restrictions performing manipulative or postural functions.

<sup>7</sup> Strength measures from the Dictionary of Occupational Titles form the basis of these RFC categories.

<sup>8</sup> SSA almost always denies applications from those in the two highest RFC categories; consequently, there are no rules for those categories.

Grid Rule 204.00 (capacity to sustain heavy or very heavy work) as a framework.<sup>9</sup> A finding of disabled is possible using Grid Rule 204.00 if the nonexertional limitation(s) significantly erode the vocational base.<sup>10</sup>

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<sup>9</sup> The following text is from Social Security Administration (2014d): “204.00 Maximum sustained work capability limited to heavy work (or very heavy work) as a result of severe medically determinable impairment(s). The residual functional capacity to perform heavy work or very heavy work includes the functional capability for work at the lesser functional levels as well, and represents substantial work capability for jobs in the national economy at all skill and physical demand levels. Individuals who retain the functional capacity to perform heavy work (or very heavy work) ordinarily will not have a severe impairment or will be able to do their past work-either of which would have already provided a basis for a decision of not disabled. Environmental restrictions ordinarily would not significantly affect the range of work existing in the national economy for heavy work (or very heavy work). Thus, an impairment which does not preclude heavy work (or very heavy work) would not ordinarily be the primary reason for unemployment, and generally is sufficient for a finding of not disabled, even though age, education, and skill level of prior work experience may be considered adverse.”

<sup>10</sup> Details on Step 5 of the disability determination process are from Social Security Administration (2014d), which is the Medical-Vocational Evaluation subsection (subchapters DI 25001.000 through DI 25025.000) in SSA’s Program Operations Manual System.

### III. RESEARCH QUESTION

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Our goal was to identify and evaluate existing literature, reports, and studies that could facilitate evidence-based conclusions about the project's research question:

*To what extent do age, education, and work experience affect a person's ability to perform work he or she has not performed before independent of all other factors, such as health, impairments and limitations, motivation, or general labor market conditions?*

The literature search excluded factors such as a person's health, impairments and limitations, motivation to work, or likelihood of obtaining employment, because our task was to focus exclusively on the relationship between the vocational factors and ability to perform new work, which is what SSA considers during Step 5 of the disability determination process. In addition, reflecting the age range over which the vocational factors are currently applied or might be applied in the foreseeable future within the disability determination process, all relevant articles we had to examine the research question for people ranging in age from 40 to 70 or at least part of that age range.

The central challenge for this literature review was finding studies and reports that isolated the narrow effects that are relevant to our research question. We anticipated finding (and did find) many studies that examine correlations and causal relationships between the vocational factors and employment. This research examines topics that have historically interested researchers, policymakers, and the public, such as how employment rates vary by age, highest degree completed, or years in the labor force. However, our research question was much narrower than examining general correlations between the vocational factors and employment. The *ability to perform work*—a key phrase in the research question that reflects the statutory definition of disability—references whether someone can work, not whether someone is working. In addition, the phrase *he or she has not performed before* in the research question confined our search to studies examining work that a person has no recent history of performing. Therefore, only studies that examined whether someone can perform work they have never performed before were relevant to our search. To our knowledge, few researchers have explicitly studied that topic. The research question also asked about the relationship between the vocational factors and ability to perform new work *independent of all other factors*. It is difficult to isolate the vocational factors' effects from those of other factors, because many factors affect workers' decisions about whether to continue work or adapt to new work as they approach retirement—as well as employers' decisions about whether to hire them.

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## IV. METHODS

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With the advent of the What Works Clearinghouse (WWC) project for the U.S. Department of Education in 2007 and its extensive requirement for systematic literature reviews, Mathematica's Library Services staff have developed and implemented a highly successful search, retrieval, and acquisition process. These services are comparable to those used by such advanced systematic review efforts as the Campbell Collaboration and the Cochrane Collaboration. We worked with the Library Services staff to develop a review strategy that drew on Mathematica's experience in conducting systematic reviews for the WWC, and a home visiting project for the U.S. Department of Health and Human Services, among others.

Our review strategy also built on the findings of a 1998 Library of Congress publication (Curtis et al. 1998) that presents the findings from an earlier literature review that encompassed this project's research question. Hence, our search considered only studies and reports released after December 31, 1997—the cutoff date for Curtis et al. (1998).<sup>11</sup>

After SSA reviewed and approved the search plan, we conducted the literature search. We identified controlled vocabulary<sup>12</sup> terms for the concepts described in Table IV.1 in databases and used in searches along with key words. Mathematica staff developed the major concepts and related search terms in Table IV.1 after reviewing Curtis et al. (1998), reviewing other background materials from SSA, and having discussions with SSA staff. We conducted preliminary searches and reviewed their results to identify additional criteria and related terms to use in subsequent searches. To optimize our ability to find relevant literature without capturing an excessively large volume of irrelevant literature, when performing proximity searches, we defined *near* as *within three words of*. Our searches did not force the exclusion of any controlled vocabulary or key words, because we did not want to exclude any potentially relevant articles from our search results.

We conducted the search for peer-reviewed articles using all major bibliographic databases and search engines that cover employment-related topics (Table IV.2). The AgeLine database includes aging-related topics. Scopus, a general and multidisciplinary database, delivers the most comprehensive overview of the world's research output. The social science databases cover various aspects of employment research. We also included Medline, because it has 52,479 entries under the medical subject heading term *employment*.

In addition to searching databases that index peer-reviewed studies, we searched three databases that index grey literature. According to Alberani et al. (1990), documents in the grey literature “may include, but are not limited to the following types of materials: reports (pre-prints, preliminary progress and advanced reports, technical reports, statistical reports, memoranda, state-of-the art reports, market research reports, etc.), theses, conference proceedings, technical specifications and standards, non-commercial translations, bibliographies,

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<sup>11</sup> To help find articles that already built upon Curtis et al. (1998) and therefore were relevant to our research question, we also searched for post-1997 studies that cite Curtis et al. (1998).

<sup>12</sup> A controlled vocabulary thesaurus (also referred to as subject terms or descriptors) is an organized list of words or phrases used to tag content so that searches can find it.

technical and commercial documentation, and official documents not published commercially (primarily government reports and documents).” Unlike peer-reviewed articles, a qualified organization or individual external to the article’s commissioning, development, or publication has not typically reviewed grey literature documents. Although grey literature documents may not be peer-reviewed, we included them because they could contain information relevant to our research question and because we planned to subject all identified documents to our own review.

**Table IV.1. Concepts and search terms for the initial search**

Concept(s)	Search term(s)
Target groups	United States working-age population, Organization for Economic Co-Operation and Development working-age population (will search country by country)
Work	Vocation, occupation, employment, skills, job, work, service, labor, skilled, unskilled, semiskilled, hire, physical, sedentary, computer literacy (possibly antonyms of underemployment, unemployment), transferable skills, career change, residual functional capacity, functional capacity, activities of daily living, worker dislocation, mid-career, occupation and labor patterns, part-time/full-time, and work in retirement
Vocational factors	Age (ages 40 to 70); education (grade level, degree, certificate, and English literacy, illiteracy, general equivalency diploma [GED], non-English speaker, foreign language, non-native, and special education); and work (including history and experience)
Ability to adapt/start new work	Employability, reentry, transfer, adjustment, job, job change, career, career change, semi- or partial retirement, learn, adapt, training, job coaching, and supported employment
Other potential combined search terms	Population health, disability prevalence, distributional effects, gender, race/ethnicity, lower socioeconomic status, grid-rules, knowledge-based jobs, and life expectancy of the disabled
Document type	Peer-reviewed journal articles, grey literature
Limitations	Studies published in English-language literature only Studies conducted in the United States Studies published from January 1998 to February 2014 Searches conducted of selected fields in each database: title, abstract, subject, and keyword (controlled vocabulary or descriptor if available)

**Table IV.2. Databases searched**

Database	Description
AgeLine	This database focuses exclusively on the population age 50 and older and issues of aging, indexing more than 200 journals, books, book chapters, and reports. Original abstracts are generated for every citation, with index terms drawn from AgeLine's Thesaurus of Aging Terminology. This database addresses aging issues from individual, national, and global perspectives.
Mathematica journals	This database provides access to thousands of electronic journals and full text of articles, as well as information on Mathematica's print journals collection.
Medline	This database covers the international literature in biomedicine, including the allied health fields and the biological and physical sciences, humanities, and information science as they relate to medicine and health care. Information is indexed from approximately 5,400 journals published worldwide.
PsycINFO	This is a comprehensive bibliographic database of psychology covering citations and summaries of peer-reviewed journal articles, book chapters, books, dissertations, and technical reports.
Scopus	This is the world's largest abstract and citation database of peer-reviewed literature and quality web sources in the scientific, technical, medical, and social sciences. It covers more than 19,000 titles, articles in press, conference proceedings, and e-books.
Self-Sufficiency Resource Clearinghouse (SSRC)	This database covers employment, education, training, and family support.
SocINDEX with Full Text	This is the world's most comprehensive and highest quality sociology research database, featuring more than 2 million records. It includes extensive indexing for books/monographs, conference papers, and other nonperiodical content sources, in addition to informative abstracts for more than 1,300 core coverage journals.
Social Science Open Access Repository (SSOAR)	This database covers employment and provides research reports and papers, journal articles and book chapters, practitioner and research briefs, fact sheets, policy briefs, government reports, dissertations, white papers, and annotated bibliographies.
Social Science Research Network (SSRN)	This database covers employment and contains abstracts and an electronic paper collection, arranged by discipline.

We searched three grey literature databases using keywords and exact phrases analogous to those used in the peer-reviewed article database searches. The three databases were the SSRC, SSOAR, and SSRN. Our search for relevant grey literature did not include a search of any individual government agency or corporate websites.

We used RefWorks to catalogue articles that met the database search parameters. Trained Library Services staff who conducted the database searches placed relevant studies into a RefWorks database and screened out studies with clearly unrelated subjects. Both this initial screen and subsequent screens were manual processes that relied on a trained reviewer's judgment. Next, a trained research assistant conducted a brief review of each remaining study,

examining the abstract and other text as necessary. The research assistant then sorted the studies into groups based on the extent to which each study related to the research question. Dr. Mann then conducted an in-depth review of the studies identified by the research assistant as potentially relevant to addressing the research question.

As planned, we used the findings of the initial review to refine the search specifications and completed a revised search. This updated search included concepts and search terms not part of the initial search (Table IV.3). In addition, we added Academic Search Premier and Business Source Corporate to the list of databases that we searched. New materials meeting the refined search parameters were placed in RefWorks for review.

**Table IV.3. Additional concepts and search terms for the updated search**

Concept(s)	Search term(s)
Work resumption	Adaptive competence, bridge retirement, career change, employment n3 resumption, job change, job n3 reentry, job n3 resumption, employment n3 reentry, employment n3 resumption, skill n3 transfer, training n3 transfer, work n3 reentry, work n3 resumption
Education	Education level

Note: n3 is database syntax for *within three words of*.

Library Services staff placed 2,320 citations into the RefWorks account after screening out 391 articles. The research assistant then reviewed the 2,320 citations' abstracts and key words and identified 26 articles that were potentially relevant to the research question. To ensure that the research assistant screened articles properly, both Library Services staff and Dr. Mann reviewed a subset of the screened-out articles to confirm that those articles were not worth further review.

We can group the screened-out articles into a few broad categories. Some of these articles described how disabilities and health issues such as diseases or obesity affected people's ability to work or probability of working. The research question excludes the consideration of how disability, health status, or health conditions affect work ability. The research assistant also screened out many articles that focused on job training for older adults in their existing jobs or the retirement decision. These articles focused on whether older workers stay at their current jobs, but do not address the extent to which they are able, or unable, to perform new work. Several screened-out articles examined interventions designed to help workers with disabilities remain at their current jobs or return to a recent job. The research question focuses on the ability to adapt to new work, not the ability to remain at a current or recent job.

Dr. Mann reviewed the abstracts and key words of the 26 articles screened in by the research assistant, and determined that 6 of those articles were promising enough for a full-text review because their abstracts and keywords appeared to address the research question. We screened out the other 20 articles for various reasons; all were clearly off topic.

The grey literature search did not identify any potentially relevant studies. It identified 306 potentially relevant citations. Library Services staff screened out all 306 citations. Overall, staff screened out the grey literature and most of the peer-reviewed articles for the same reasons (see

previous descriptions). In addition, staff screened out several grey literature articles written in languages other than English.

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## V. FINDINGS

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The main finding is that, although many studies examine the relationship between the vocational factors and employment, we were unable to find articles that directly addressed any aspect of the research question. That is, we found no rigorous evidence of the independent effects of age, education, and work experience on the ability to perform new work. The database searches did return thousands of potentially relevant peer-reviewed articles, but we were unable to find any that provide the specific sort of evidence that SSA asked us to find (Table V.1).

**Table V.1. Found and reviewed peer-reviewed articles**

Article category	Count
Identified during the database searches as potentially relevant	2,711
Screened out by Library Services staff member	391
Abstract reviewed by the research assistant	2,320
Screened out by the research assistant	2,294
Abstract reviewed by Dr. Mann	26
Screened out by Dr. Mann	20
Full text reviewed by Dr. Mann	5
Contains tangentially relevant evidence	1
Identified in article reference lists as potentially relevant	85
Screened out by Dr. Mann	84
Contains tangentially relevant evidence	1

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After a full-text review, only one of the six articles provided evidence at least tangentially relevant to the research question. The six articles focused on the employment of older workers, with the one potentially relevant article (Sanders et al. 2011) discussing features of work that increase the work ability and motivation of older workers with low education.

Dr. Mann also reviewed abstracts for 85 articles cited by the 6 articles that he had screened in for full-text review. Only Thomson et al. (2005)—an Australian report investigating whether skill development activities for older workers improve productivity and labor force attachment—provided tangentially relevant evidence.

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## VI. DISCUSSION

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At SSA's request, we conducted a literature review to identify all articles that examine the following research question: To what extent do age, education, and work experience affect a person's ability to perform work he or she has not performed before independent of all other factors? The literature review did not identify any articles in the peer-reviewed or grey literature that directly addressed any aspect of this specific question. We identified two articles as containing tangentially relevant evidence. However, because the content of the two tangentially relevant articles did not directly address the research question, at best they are of limited value for informing consideration of changes to how the disability determination process uses the vocational factors.

In contrast to this study, the last SSA-sponsored literature review on vocational factors (Curtis et al. 1998) found some studies with information of relevance. This is because they searched for literature that addressed a broad range of research questions related to the vocational factors and disability and did not restrict their search to the specific question that is the focus of this study. The studies they found did not directly address our research question either.

Studies that address a broader range of questions can potentially help inform discussions about the use of vocational factors in the disability determination process. Examples include the following:

- How do the vocational factors affect work (as opposed to ability to work), and to what extent are observed relationships explained by factors other than ability to work?
- How do the vocational factors affect return to work following permanent layoffs (for example, due to downsizing), and to what extent are observed relationships explained by factors other than ability to work?
- How do the vocational factors affect return to work following the onset of a significant medical condition, and to what extent are observed relationships explained by factors other than ability to work (for example, the nature of the medical condition and coverage by long-term disability insurance or workers' compensation)?
- How do the vocational factors affect measures of the cognitive and physical abilities of individuals—particularly those abilities essential to engaging in nonexertional work?
- How do the vocational factors affect biological age, as defined by biomarkers that predict mortality, or functional age, as defined by biomarkers that predict major functional limitations (limitations consistent with inability to work)?

Although studies that address these and related questions might inform discussions about use of vocational factors in the disability determination process, establishing the connection between the information they provide and how the disability determination process specified and used vocational factors will require considerable care.

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