



An Evaluation of the Value of HR Certification for Individuals and Organizations

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Date: April 17, 2015

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Abstract

Over the past few decades, there has been increasing interest among researchers and practitioners in the value of human resources (HR) certification. Despite this, there is a dearth of empirical research on the value of HR certification to individual HR professionals and the organizations that employ them. The current study helps address this void by evaluating whether HR professionals' certification status related to several outcomes of value to individuals and organizations. Of particular focus in this study were the two most prevalent HR certifications in the world, the HR Certification Institute's Professional in Human Resources (PHR[®]) and Senior Professional in Human Resources (SPHR[®]). The results of this study reveal that HR professionals' certification status relates positively to a diverse array of valued outcomes such as compensation, career satisfaction, and job performance, though negatively or not at all to promotion and professional growth-related outcomes. Suggestions for future research to address this study's limitations and further evaluate the value of HR certification are provided.

Introduction

Over the past few decades, there has been increasing interest among researchers and practitioners in the value of human resources (HR) certification. In 2012 an entire special issue of *Human Resources Management Review* (HRMR) was devoted to the topic of HR certification (Thacker, 2012). Of the HR certifications available, the most prevalent are those offered by the HR Certification Institute (HRCI). As of 2014, the HRCI website notes that more than 135,000 HR professionals in more than 100 countries have earned at least one of its six HR certifications. Despite evidence of the growing popularity of HR certifications among employers (Cohen, 2012; Lyons, Mueller, Gruys, & Meyers, 2012), little empirical evidence links certification status to individual-level or macro-level outcomes of concern to individuals and organizations. To date, most studies that have examined the value of HR certification have focused either on individuals' or employers' perceptions of the value of certification (e.g., HR Certification Institute, 2010; Lester, Fertig, & Dwyer, 2011; Wiley, 1992) or on whether employers consider certification status when making employment decisions about HR professionals (e.g., Aguinis, Michaelis, & Jones, 2005; Lester, Mencl, Maranto, Bourne, & Keaveny, 2010; Lester et al., 2011; Lyons et al. 2012). No studies used research methods designed to account for potential alternative explanations for observed relations between HR certification status and outcomes, such as differences between certificants and non-certificants on HR experience, job level, or education level.

Certainly it is useful to know that individuals and employers believe that HR certification is valuable, that the number of people seeking certification is growing, and that many organizations do consider certification when making employment decisions. Still, this evidence is not based on empirical evidence of relations between certification status and actual outcomes that individuals and organizations care about, such as job performance or career growth. Indeed, the business management field is rife with examples of organizations widely adopting HR practices (e.g., overreliance on unstructured employment interviews and intuition in the hiring process, Highhouse, 2008; equating of self-reported experience with actual competence, U.S. Merit Systems Protection Board, 2014) and organizational researchers widely adopting methods (e.g., Lance & Vandenberg's 2009 and 2014 works on statistical and methodological myths and urban legends) that have been largely discredited upon further scientific scrutiny. In

other words, just because “everybody else appears to be doing it” when it comes to using HR certification for decision making does not mean there is an empirically defensible rationale for doing so; assuming so is faulty logic. Indeed, institutional theorists argue that organizational practices are often adopted just to enhance the appearance of legitimacy, or because large or successful organizations are adopting them, rather than because of a demonstrated relation to performance outcomes (DiMaggio & Powell, 1983; Fertig, 2011).

In light of the observations above, and in partial response to Aguinis and Lengnick-Hall’s (2012) challenge to the HR certification industry to sponsor more rigorous empirical research on the value of HR certification, the current study was carried out to evaluate whether HR certification status relates to key individual-level outcomes of value to HR professionals and the organizations that employ them. This study focuses on evaluating the relations between various outcomes and the two most prevalent HR certifications in the world, HRCI’s Professional in Human Resources (PHR®) and Senior Professional in Human Resources (SPHR).

The PHR® certification is intended for HR professionals who focus on program implementation, have a tactical/logistical orientation, are accountable to another HR professional within the organization, and have responsibilities that focus on the HR department rather than the whole organization. The SPHR® certification is intended for HR professionals who plan, rather than implement, HR policy, focus on the “big picture,” have ultimate accountability in the HR department, have breadth and depth of knowledge in all HR disciplines, understand the business beyond the HR function, and influence the overall organization. (For more information, see: <http://www.hrci.org/our-programs/our-hr-certifications>.) Each certification is based on a carefully specified body of knowledge (BOK) that comprises six functional areas: Business Management and Strategy, Workforce Planning and Employment, Human Resource Development, Compensation and Benefits, Employee and Labor Relations, and Risk Management. The same functional areas appear in the BOK for each certification, but the weight assigned to each area differs across certifications.

Current Literature

A flurry of research over the past decade has begun to address the value of certification from the perspective of individual employees and of organizations. Perhaps the most comprehensive summary of work to date in this area is Lengnick-Hall and Aguinis’s (2012) synopsis appearing in HRMR’s special issue on HR certification. In their article, they describe a parsimonious, multi-level framework for future HR certification research. The framework illustrates how obtaining an HR certification may influence individual-level outcomes such as job performance, pay, and promotion, as well as macro-level outcomes such as an HR department’s effectiveness and reputation. They also offer a series of research propositions that identify which individual and macro-level outcomes have yet to be adequately addressed in the scientific literature. We believe their propositions highlight three main areas of uncertainty:

- uncertainty about differences between HR certificants and non-certificants on individual-level outcomes such as: HR management knowledge (Proposition 4), job performance (Proposition 5), compensation (Proposition 7), probability of being hired (Proposition 8), and commitment to the HR profession (Proposition 9);
- uncertainty about how HR certification relates to group-level outcomes, such as how the proportion of certified HR professionals working in an HR department affects that department’s reputation within the organization or its overall effectiveness (Propositions 11-13); and

- uncertainty about the type of individuals who would benefit most from obtaining an HR certification (e.g., those with or without an HR-related educational degree) (Propositions 2 and 3).

Lengnick-Hall and Aguinis (2012) cited various bodies of literature and made logical arguments that suggest certified HR professional *should* exhibit more positive outcomes than noncertified HR professionals. These hypotheses are ripe for testing using appropriate research methods.

The Current Study

A common theme underlying the areas of uncertainty highlighted above is that little criterion-related validity evidence exists for HR certification. At the individual-level of analysis, this means that there is no clear evidence of a statistically significant relation between HR professionals' certification status and individual-level outcomes of interest to individuals and organizations. At a more macro-level of level of analysis, this means that there is no clear evidence of a statistically significant relation between the presence of HR certified professionals in an HR department and department-level or organizational-level outcomes (e.g., departmental effectiveness or reputation within the company). Although both of these represent legitimate lines of inquiry, we focused the current study on the former – that is, evaluating criterion-related validity evidence for the claim that HR professionals' certification status is related to a variety of individual-level outcomes that have value for those individuals and the organizations that employ them.

Using Lengnick-Hall and Aguinis's (2012) article and past work on the perceived value of HR certification as a starting point, we identified eight individual-level outcomes that should, in theory, relate to PHR® and SPHR® certifications. The eight outcomes cover the full employment lifecycle and clearly have value to the individual HR professionals or the organizations that employ them:

- a) obtaining employment in the HR profession,
- b) being promoted,
- c) having opportunities for professional growth,
- d) being paid,
- e) being satisfied with one's career,
- f) job performance,
- g) future potential for higher-level positions, and
- h) level of HR expertise.

A great deal of research shows that the first four outcomes reflect elements of work that matter to virtually everyone, although individuals vary in how much they value each one (Dawis & Lofquist, 1984; Wiley & Kowske, 2011). Obtaining employment reinforces individuals' basic need for secure employment. Having opportunities for promotion and career growth reinforces individuals' needs for achievement, advancement, recognition, and social status. Being paid for working reinforces individuals' basic need to support their desired lifestyle. The fifth outcome, career satisfaction, can be viewed as a general, overall outcome that stems from having one's work and career-related needs satisfied (Seibert, Kraimer, Holtom, & Pierotti, 2013).

The hypothesis that a relation exists between PHR® or SPHR® certification and these outcomes rests on two arguments. The first is that the certification process itself ensures that certificants possess the amount and type of HR expertise relevant for performing effectively as an HR

professional (Cohen, 2012; Tornow, 1984). This claim is supported by content validity evidence available for PHR[®] and SPHR[®] (Cohen, 2012) showing that each certification process involves delineating a BOK and a systematic process for ensuring that certificants have and maintain acceptable levels of expertise related to the BOK. The second argument is that organizations do, in fact, differentiate among HR professionals, such that those with higher levels of HR expertise will be recognized and differentially valued at key points in the employment lifecycle (e.g., hiring, promotion, annual performance appraisal, salary review). To the extent that organizational employment decisions and systems (e.g., selection, performance management) operate in this manner, one should observe individuals with relatively higher levels of HR expertise (as indicated by HR certification status) (a) be more likely to get hired in an HR job, (b) have greater opportunities for professional growth, (c) be promoted at a faster rate, and (d) receive more compensation than individuals with lower levels of HR expertise (all else being equal). In turn, to the extent HR certificants are more likely than their non-certified counterparts to experience these positive outcomes, it would seem reasonable to expect them to also be more satisfied with their HR careers relative to non-certificants.

Whereas the first five outcomes are of clear interest to individual employees, the last three outcomes are of clear interest to organizations as they seek to achieve and maintain a high-performing, high-potential, knowledgeable HR workforce. Outcomes such as individuals' job performance, their potential for performing well in higher-level positions, and their level of HR technical expertise all have clear importance to organizations. The same logical arguments apply here: PHR[®] and SPHR[®] certification does lead to higher levels of HR expertise, and such expertise is critical to effective performance of HR professionals.

We embarked on a study to address research questions pertaining to eight key outcomes (see Table 1). Each research question provides a type of criterion-related validity evidence. As we describe later, where the available data allowed us to do so, we attempted to answer each question for PHR[®] certificants and SPHR[®] certificants separately. Specifically, we asked, "Do PHR[®] certificants experience more positive outcomes than non-certificants?" and "Do SPHR[®] certificants experience more positive outcomes than non-certificants?"

Table 1. Summary of Key Outcomes and Research Questions

Outcomes/Research Questions	
Outcome 1: Employability	
RQ1a	Are organizations requiring or preferring an HR certification when hiring HR professionals?
RQ1b	Are non-certified HR professionals less likely to be employed full-time in an HR-related profession than certified HR professionals?
Outcome 2: Promotions	
RQ2a	Have certified HR professionals advanced in their careers more quickly than non-certified HR professionals?
RQ2b	Have certified HR professionals advanced in their careers more quickly after becoming certified relative to before their certification?
Outcome 3: Opportunities for Professional Growth	
RQ3	Have certified HR professionals had more opportunities for professional growth than non-certified HR professionals?
Outcome 4: Compensation	
RQ4a	Do certified HR professionals have higher annual incomes than non-certified HR professionals?
RQ4b	Have certified HR professionals experienced greater growth in their annual income than non-certified HR professionals?
RQ4c	Have certified HR professionals experienced greater growth in their compensation after becoming certified relative to before their certification?
Outcome 5: Career Satisfaction	
RQ5	Are certified HR professionals more satisfied with their HR careers than non-certified HR professionals?
Outcome 6: Job Performance	
RQ6a	Do certified HR professionals perform better on the job than non-certified HR professionals?
RQ6b	Do certified HR professionals perform better on strategic HR tasks than non-certified HR professionals?
Outcome 7: Future Potential	
RQ7	Are certified HR professionals viewed as having more potential for higher level positions than non-certified HR professionals?
Outcome 8: HR Technical Expertise	
RQ8	Are certified HR professionals rated as having more expertise in core HR bodies of knowledge than non-certified HR professionals?

Method

We conducted two large-scale online surveys and obtained extracts of data from HRCI archival records to evaluate the research questions outlined above. The first survey was directed at PHR® and SPHR® certificants, as well as a sample of non-certified HR professionals. All were identified through HRCI's archival records. The second survey was directed at supervisors of the HR certificants and non-certificates who completed the first survey.

Sample

HRCI's archival database contains information on all current and past recipients of HR certifications issued by HRCI (including the PHR® and SPHR®), as well as individuals who either took and failed one of HRCI's certification exams, or who began the certification application process but never completed it.

From this database, HRCI identified 111,449 certificants and 157,728 non-certificants for potential inclusion in this study. Certificants were defined as those individuals who held a PHR® or SPHR® as of August 2014 based on HRCI archival records.¹ Non-certificants were defined as those individuals who had a record in HRCI's archival database but had never passed or taken the PHR® or SPHR® certification exam as of August 2014. Specifically, some of these non-certificants completed a PHR® or SPHR® exam but received a failing score (41%), whereas others started the application required to take an HRCI certification exam but never completed the application (59%). The population of potential participants was also limited to those individuals who had an existing e-mail address on record with HRCI and had granted HRCI permission to contact them in the future. It is important to note that most non-certificants do not keep their personal records up-to-date in HRCI's archival database, so some of their database information (e.g., employer, work location) is likely outdated. Therefore, we used only certification status information from HRCI's archival database when conducting analyses. All personal information variables (e.g., race, gender, age, employment location, size of employer) were collected through self-report questions in the current surveys.

On August 22, 2014, HRCI launched the career survey by e-mailing invitations to certificants and non-certificants, asking them to complete an online survey. Respondents were also asked to provide the name and e-mail address of their direct supervisor so that s/he could be surveyed. Participants were informed that their supervisors would be asked to provide an evaluation of their job performance and HR expertise, and that their own responses and their supervisors' would remain confidential and used for research purposes only. HRCI then emailed an invitation to each supervisor identified by a career survey respondent, describing the study and asking him/her to complete an online survey about their subordinate. The survey portal was closed on September 30, 2014.

Prospective participants were offered a variety of incentives to encourage participation (and their supervisors' participation) in the study. Specifically, participants who provided contact information for their supervisor were entered into a raffle for prizes that included (a) \$25 Amazon gift cards (20 cards total), (b) HRCI certification scholarships that provide funding toward exam preparation or exam fees (10 scholarships total), (c) Kindle Fires (3 total), and (d) various HRCI-branded items such as PHR®/SPHR® Certification guides (more than 1,000 total). In addition, all HRCI certified participants were offered one hour of recertification credit. Finally,

¹ Individuals who held a PHR® or SPHR® certification in the past but had let their certification expire were excluded from the study.

all participants were invited to attend a webinar describing the results of the study when they became available.

Of the 111,449 certificants invited to participate, 11,985 completed a survey, resulting in a response rate of 10.8%. Of the 11,985 certificants who completed a survey, 4,248 provided the name and e-mail address of their supervisor (35.4%), and 1,914 of these supervisors completed a supervisor survey. Of the 157,728 non-certificants invited to participate, 5,601 completed a survey, resulting in a response rate of 3.6%. Of the 5,601 non-certificants who completed a survey, 1,210 provided the name and e-mail address of their supervisor (21.6%), and 503 of these supervisors completed a supervisor survey. In total, 17,586 completed career surveys were returned, and 2,417 completed supervisor surveys were returned. These sample sizes were further reduced as we processed and cleaned the data for analysis.

Measures

As noted above, two types of online surveys were administered in this study – a “career” survey administered to certificants and non-certificants, and a “supervisor” survey administered to supervisors of those who completed the career survey. Both surveys were custom-developed for this study. The sections below describe the development of the surveys, with particular emphasis on the measurement of variables that played a central role in the evaluation analyses.

Development of the career and supervisor surveys followed directly from the specification of outcomes and research questions summarized in Table 1. We carefully thought about (a) the types of data that would be needed to address each question, (b) whether those data were already available from HRCI archival records, (c) whether those data would be better collected from participating certificants/non-certificants or their supervisors, and (d) what if any established measures from past research could be used. The survey development effort was spearheaded by a team of industrial-organizational (I-O) psychologists with expertise in psychometrics, survey design, and many of the outcome domains of interest in the current study (e.g., job performance, compensation). All questions were carefully vetted by HRCI staff to ensure language appropriate for HR professionals and pilot-tested on small samples of HR professionals. Based on the two surveys, as well as archival data extracted from HRCI records, three types of measures were constructed: (a) HR certification status (our primary predictor variable of interest), (b) outcome measures (for use in each research question), and (c) control variables (that served as covariates for most analyses).

HR Certification Status

The HR certification status measure was formed based on a combination of survey data and archival HRCI data and took on one of three values: “PHR[®] Certificant” if the individual currently held a PHR[®] or PHR-California (PHR-CA[®]) certification, “SPHR[®] Certificant” if the individual currently held an SPHR[®] or SPHR-California (SPHR-CA[®]) certification, and “Non-Certificant” if the individual never had a PHR[®] or SPHR[®] certification yet met the eligibility requirements for at least the PHR[®] certification (i.e., the individual met the level of education and work experience requirements needed to be eligible for PHR[®] certification as of 2014 (HR Certification Institute, 2014). Individuals who did not meet the eligibility requirements for at least a PHR[®] certification were assigned system missing values on the HR certification status variable. Although it is possible for individuals to obtain both PHR[®] and SPHR[®] certifications over the course of their career, a person can possess only one at a time. Therefore, each certificant clearly belonged to either the PHR[®] or the SPHR[®] group.

Outcome Variables

We created outcome variables for addressing each research question based on responses to various career and supervisor survey items. We provide an overview of these variables below.

Employability

To address research question 1a, supervisors were asked whether their organization (a) *requires* an HR certification such as PHR® or SPHR® when hiring for HR positions, and (b) *prefers* an HR certification when hiring for HR positions. Supervisors were given four options for each question: (a) “yes, for all HR positions;” (b) “yes, for some HR positions;” (c) “no;” and (d) “don’t know or not sure.”

To help address research question 1b, certificants and non-certificants were asked whether they were currently employed full time in an HR-related position. If they answered “no,” they were asked to indicate the primary reason. A range of reasons was offered, with the reasons subsequently grouped into voluntary (i.e., not employed full-time in an HR-related position by choice) and involuntary (e.g., could not find a suitable full-time HR position).

Promotions

To address research question 2a, certificants and non-certificants were asked to indicate (a) the number of promotions they received during their entire HR career and (b) their number of years in the HR profession. We created a promotion rate variable by dividing the number of promotions a respondent reported receiving by their number of years in the HR profession. As we note later, individuals who reported substantial gaps in their HR employment history were omitted from all analysis samples to avoid (a) inaccuracies in calculation of growth rate variables (e.g., promotion rate, income growth) and temporally related control variables (e.g., years in HR), and (b) ambiguities when interpreting the results.

To address research question 2b, certificants were asked to indicate the number of promotions they received pre- and post-certification, and their number of years in HR pre- and post-certification. Pre-certification/post-certification promotion rate outcome variables were formed by dividing number of promotions (pre- or post-certification) by number of years in the HR profession (pre- or post-certification).

Opportunities for Professional Growth

To address research question 3, certificants and non-certificants were asked to indicate their agreement with three statements on a 1 (strongly disagree) to 5 (strongly agree) scale: (a) “I have had opportunities to take on assignments/jobs that require learning new knowledge and skills,” (b) “I have had opportunities to take on developmental assignments/jobs that stretched my abilities,” and (c) “I have had opportunities to pursue challenging assignments and jobs.” Certificants were asked to indicate their agreement with these items since receiving their certification, and non-certificants were asked to indicate their agreement with these items since they started their career in the HR profession. An “opportunities for growth” composite was formed by averaging these items. The resulting composite exhibited strong internal consistency reliability ($\alpha = .96$).²

² Note, all statistics reported in this section (e.g., reliability estimates, factor analysis results) were calculated after data cleaning (described in a later section).

Compensation

To address research question 4a, certificants and non-certificants were asked to provide their current annual total income in U.S. dollars from their primary job.³ To address research question 4b, certificants and non-certificants were also asked to provide their annual total income in U.S. dollars at the start of their HR career and their number of years in the HR profession. An annual income growth composite was formed by dividing the difference between respondents' current income and their income at the start of their HR career by their number of years in the HR profession. Prior to calculating this composite, respondents' income at the start of their HR career was adjusted to 2014 U.S. dollars using the Consumer Price Index (all urban consumers, U.S. city average).

To address research question 4c, certificants were asked to provide their annual total income in U.S. dollars immediately before they received their certification. Along with the other income-related questions, these variables were used to form pre-/post-certification income growth composites. A pre-certification income growth composite was formed by dividing the difference between respondents' starting income (at the beginning of their HR career) and their income immediately before certification by their number of years in the HR profession prior to their certification. Similarly, a post-certification income growth composite was formed by dividing the difference between respondents' current income and their income immediately before certification by their number of years in the HR profession post-certification. Once again, prior to calculating these composites, respondents' incomes at the start of their HR career and immediately before certification were adjusted to 2014 U.S. dollars using the Consumer Price Index (all urban consumers, U.S. city average).

Career Satisfaction

To address research question 5, certificants and non-certificants were administered Seibert et al.'s (2013) 12-question career satisfaction measure. The measure is designed to assess satisfaction with one's (a) power and status, (b) financial success, (c) knowledge and skill development, and (d) employability. All questions are rated on a 1 (very dissatisfied) to 5 (very satisfied) scale. A career satisfaction composite was formed by averaging responses across all 12 items. The composite exhibited high internal consistency reliability ($\alpha = .90$).

Job Performance

To address research question 6a, supervisors completed a 21-item measure of job performance grounded in Campbell's extensive work on the structure of job performance (Campbell, 2012; Campbell, McCloy, Oppler, & Sager, 1993). The measure covers seven dimensions of performance present in virtually all jobs: (a) technical performance, (b) communication, (c) effort and initiative, (d) professionalism and discipline, (e) peer support, (f) leadership, and (g) management. (The management dimension does not necessarily occur in non-management jobs.) Three items were administered for each dimension and written in a general form that could apply to any HR professional job. Supervisors were provided guidance on how to avoid common rating errors (e.g., halo, recency bias) prior to completing the performance items, and then asked to rate their participating subordinate's typical performance on each item using a scale that ranged from 1 (needs a lot of improvement) to 5 (demonstrates a real strength).

³ As we note later, only full-time HR professionals were included in analyses for all outcomes (with the exception of the employability outcome).

Supervisors were also allowed to indicate that they could not rate a given item, either because the item was not part of their subordinate's job or because the supervisor had not observed that particular aspect of performance.

Although the study design did not allow us to estimate the interrater reliability of the performance ratings, the seven dimension-level scores (formed by averaging the three items for each dimension) yielded strong internal consistency reliability (alphas ranged from .71 to .89). Given the ratings-based nature of the measure and the fact that only a single rater was available for each certificant/non-certificant, we anticipated a dominant first factor underlying the items, and indeed that was what we found. A confirmatory factor analysis revealed reasonable fit for a single-factor model, (Chi-Square = 4712.17; CFI = .75, TLI = .72, SRMR = .07, RMSEA = .12), and an exploratory factor analysis clearly suggested the presence of a dominant single factor (i.e., 1st eigenvalue = 9.4, next largest eigenvalue = 1.5). In light of these results, we created an overall job performance composite by averaging responses across the 21 job performance items. This composite exhibited strong internal consistency reliability ($\alpha = .94$).

It is important to note that despite the presence of a strong single factor underlying the performance ratings, it was very important to ask supervisors to evaluate many aspects of performance, rather than simply providing a single overall performance rating. Our approach forced supervisors to reflect on different aspects of performance, and the resulting composite score incorporates the subordinate's relative strengths and weaknesses.

To address research question 6b, supervisors completed a three-item measure of their participating subordinate's performance on strategic HR tasks, namely (a) developing HR strategic plans that align with the organization's strategic plan, (b) anticipating future organizational priorities and adjusting current HR plans and processes to meet them, and (c) providing timely and accurate consultation on probable barriers and enablers to organizational performance. Once again, supervisors received guidance on ways to avoid common rating errors prior to completing the performance items and then rated their participating subordinate's typical performance on each item using a scale that ranged from 1 (needs a lot of improvement) to 5 (demonstrates a real strength). Supervisors were also allowed to indicate that they could not make a rating on any given item, either because the item was not part of the subordinate's job or because the supervisor had not observed that particular aspect of performance. A strategic HR performance composite was formed by averaging the aforementioned items together, and the composite exhibited strong internal consistency reliability ($\alpha = .90$).

Future Potential

To address research question 7, supervisors were asked to indicate their level of confidence that their participating subordinate would perform well at a higher-level position (i.e., one with increased managerial and strategic responsibilities). Supervisors provided ratings on a scale ranging from 1 (not at all confident) to 4 (very confident).

HR Technical Expertise

To address research question 8, supervisors rated their participating subordinate's HR technical expertise on six dimensions that parallel the functional areas in HRCI's PHR[®] and SPHR[®] BOK, plus a seventh area added specifically for this study: (a) business management and strategy, (b) compensation and benefits, (c) employee and labor relations, (d) workforce planning and employment, (e) human resource development, (f) risk management, and (g) employment law. (Employment law was added because this is an area of expertise that market research suggests

is a strong benefit of HR certification.) Definitions for each area were adapted from HRCI's BOK definitions. Supervisors provided ratings on a 1 (novice) to 5 (expert) scale, and descriptive anchors were provided for scale points 1, 3 (intermediate), and 5 to help ensure supervisors were defining levels of expertise similarly. An HR technical expertise composite was formed by averaging ratings across dimensions, and the composite exhibited strong internal consistency reliability ($\alpha = .91$).

Control Variables

As we note below, the majority of our analyses involved examining the relations between HR certification status and the outcome variables while controlling for other variables. This helped ensure that any outcome differences observed between certificants and non-certificants were not simply a function of several other ways in which certificants and non-certificants may differ (beyond certification status). The control variables can be broken down into three types: (a) characteristics of the participants (i.e., race, sex, age, level of education/major, years since graduation, holder of other HR certifications, years in the HR field, number of organizations worked for), (b) characteristics of the jobs they held (e.g., HR focus, job/seniority level, organizational tenure), and (c) characteristics of the department or organization in which they worked (i.e., sector, industry, size of organization, size of HR department). All control variables were based on participants' career survey responses.

Analyses

Prior to evaluating any of the research questions, or evaluating the psychometric properties of the outcome variables described above, we carefully examined the survey data for omissions, logical inconsistencies, and other types of errors (e.g., out of bound values). We also finalized decisions regarding the coding of categorical control variables and the definition of samples for final analyses. The sections below describe how we prepared the data for analyses, results of data cleaning, and our general analytic approach to addressing the research questions.

Data Preparation and Cleaning

As noted earlier, a total of 17,586 individuals completed a career survey, and 2,417 supervisors completed a supervisor survey. Our data preparation and cleaning proceeded through several steps but focused on (a) checking for out of bound values, (b) checking for within-survey inconsistencies (e.g., a respondent reporting a combination of dates that was not possible), (c) checking for cross-survey inconsistencies (e.g., a certificant and supervisor providing responses to related questions that were not consistent with each other), (d) checking for extreme univariate and multivariate outliers, (e) screening out supervisors who indicated a lack of familiarity or lack of experience with the subordinate they were asked to rate, (f) coding of open-ended text responses (e.g., "other" HR roles and "other" academic majors), and (g) collapsing and recoding "small *n*" groups within categorical control variables.

In addition to basic data cleaning, another key decision at this point was finalizing the population of interest for the study. In a typical research survey, the population of interest is defined prior to survey administration. The survey is then targeted distributed only in the population of individuals of interest. In this study, we lacked current demographic information for certificants/non-certificants in the HRCI archival database, which made it impossible to narrow our study population, prior to survey distribution, on factors such as current HR role (e.g., HR consultant, HR academician, HR practitioner), geographic location (e.g., U.S. or outside U.S.),

or sector. Thus, career survey invitations were sent out to all certificants/non-certificants in HRCI's archival database who met the very general participation criteria outlined earlier.

Ultimately, we decided to define the population of interest as individuals who reported their current status as a full-time, civilian HR practitioner employed by an organization (not HR consultants, not academicians, not self-employed) working in the United States, and who have not had substantial gaps in their career as an HR professional. We excluded respondents who are currently self-employed because they do not have a supervisor and because they would have missing or odd data on control variables such as organization/HR department size and job level. We excluded professionals outside of the U.S. because it was beyond the scope of this study to establish a reliable, common metric for compensation-related outcomes across countries and the vast majority of respondents worked within the United States. We excluded part-time HR professionals and those who had substantial employment gaps in their HR career because several control variables, and all growth-related outcomes, are contingent on accurate information about years spent in the HR profession. We were concerned about the accuracy of their responses to questions about HR experience and therefore erred on the side of caution by excluding them from our core population of interest. Finally, we excluded HR consultants, HR academicians, and HR professionals in uniformed military service because there may be significant differences between them and most other HR professionals in how their job roles are structured or in the type of HR activities they perform, coupled with the fact that they constituted a small percentage of the sample. In general, we erred on the side of cleanly defining a population whose data we could be confident about (i.e., in terms of its accuracy), while retaining as many data as we reasonably could and limiting our final analysis sample to those who meet the criteria for inclusion in the target population.⁴

Applying the decision rules just described, we created two primary analysis samples. The career survey sample was used when modeling outcomes that were completely based on the career survey data, whereas the merged career-supervisor sample was used when modeling outcomes that were based on the supervisor survey data. Having separate analysis samples allowed us to maximize the number of cases used when modeling career survey-based outcomes, because those analyses did not need to be limited to only certificants/non-certificants with supervisor survey data.

Table 2 summarizes the starting and final sample sizes, as well as the number of individuals removed during the data cleaning and population definition process for the reasons noted.

Analytic Approach to Evaluating Research Questions

The primary goal of this study is to examine the relation between HR certification status and the eight types of outcome described earlier. The certificant and non-certificant groups already exist in the population of HR professionals, we could not randomly assign study participants to experimental and control groups (i.e., a true experimental design). We considered using a design in which we pre-match certificants and non-certificants on a number of key variables. (e.g., level of HR experience, job level, etc.), but this was not possible because we could not be certain that these variables were accurate for all individuals in HRCI's archival database. (Recall that individuals who entered their information in the database at one point in time likely did not keep that information up to date if they ultimately did not pursue or did not succeed in earning one of HRCI's certifications.) Therefore, we distributed the career survey to virtually all

⁴ Although the groups described here and reflected in Table 2 were excluded from our analysis samples, their data may be made available for future researchers to consider (through HRCI).

certificants and non-certificants in HRCI’s archival database, relying on obtaining a very large sample and assuming that it would be reasonably representative of the HR profession as a whole.

Table 2. Final Analysis Sample Sizes

	Career Survey Sample	Merged Sample
Starting sample size	17,586	2,705
Final sample size	10,116 ^a	1,618
Reason for Elimination		
Job type		
Academic	136	26
Consultant	1,284	207
Self-employed	266	25
Other non-HR practitioner role	610	80
Employer		
Uniformed military	94	23
Employed outside of the U.S.	1,078	169
Other factors		
Participant had other HRCI certifications	156	28
Employment gaps totaling > 3 years	2,725	470
Not eligible for at least PHR [®] certification	158	35
Supervisor factors		
Does not supervise the ratee	48	48
Less than 6 months supervising the ratee	223	223
Not familiar with the ratee’s job performance	45	45
Not familiar with the HR profession	18	18

Note. Cases could be excluded for more than one reason. Therefore, the frequencies reported in this table do not sum to match the difference between the starting and final analysis sample sizes.

^a Final sample size for research question 1 was 12,208 because we included those who were not employed full-time.

Given the observational nature of these data, differences between HR certificants and non-certificants on the outcomes of interest *could* have little to do with the certification itself, and could simply reflect factors that are correlated with the outcomes of interest and on which HR certificants and non-certificants tend to differ. We dealt with this possibility to the extent possible by controlling for a number of factors that may relate to both the outcomes of interest and HR certification status.

As we describe in more detail in the Results section, we generally used a series of multiple regression models to evaluate each research question.⁵ Specifically, we first examined whether certification status was related to the given outcome, without accounting for any control variables. This provides a baseline for examining differences between certificants and non-certificants on the outcome of interest but does little to inform whether the observed relation is a

⁵ For certain research questions, we deviated from this general approach. These exceptions are described in the Results section.

function of HR certification status or of other variables that might covary with certification status and the outcome. Next, we fitted a hierarchical regression model where all control variables were entered in Step 1 of the model and then the certification status variables were entered in Step 2.⁶ The test of the change in model R^2 between Steps 1 and 2 provides the test of whether a significant relation exists between HR certification status and the outcome, after accounting for other potential factors. Furthermore, the test of the regression coefficients for the PHR[®] and SPHR[®] variables included at Step 2 provides the test of whether PHR[®] and SPHR[®] certificants (respectively) significantly differ from non-certificants on the outcome of interest, controlling for other potential factors.

As a follow-up to the regression analyses described above, we conducted analyses to determine whether the relations between certification status and outcomes differed as a function of the individual participant’s employment sector (i.e., private sector vs. public sector vs. non-profit) or HR focus (i.e., HR specialist vs. HR generalist). We added a third step to the hierarchical regression models described above in which we entered interaction terms that crossed employment sector and HR focus with HR certification status. We fitted separate regression models to isolate the potential moderating effects of employment sector and HR focus.

Results

In the sections below, we summarize key results of the study. We begin by describing the composition of the analysis samples and correlations among the outcome variables. We then turn to the evaluation of each research question.

Composition of Final Analysis Samples

Tables 3 and 4 summarize the composition of the final analysis samples. Groups listed in bold, italic font in Table 3 served as referent groups when fitting the regression models, and dummy variables were created for all other groups such that a value of “1” was assigned to a respondent if s/he was a member of the given group, and a value of “0” was assigned to a respondent if/she was not a member of the given group.

As Tables 3 and 4 reveal, the composition of both samples is very similar. We view this as a positive finding, given that supervisor survey data were available for only a subset of individuals who completed the career survey. This reduces any concern that the sample of certificants/non-certificants whose supervisors responded to the supervisor survey systematically differ from the full sample of career survey respondents.

Table 3. Composition of Samples – Categorical Variables

Variable	Career Survey Sample		Merged Sample	
	<i>N</i>	%	<i>N</i>	%
Certification status				
<i>Non-Certificant</i>	3,566	29.2	262	16.2
PHR [®]	5,645	46.2	891	55.1

⁶ In this case, two dummy-coded certification status variables were entered one for PHR[®] (1 = PHR, 0 = No PHR) and one for SPHR[®] (1 = SPHR, 0 = No SPHR). Therefore, the reference group for this set of HR certification status variables was non-certificants.

SPHR®	2,997	24.5	465	28.7
Sex				
Female	8,259	84.0	1,383	85.7
Male	1,571	16.0	231	14.3
Race/Ethnicity				
African-American	1,007	10.4	143	9
Asian	301	3.1	35	2.2
Caucasian	7,401	76.3	1,279	80.1
Hispanic	696	7.2	94	5.9
Other	298	3.1	46	2.9
Level of Education/Major				
Less than Bachelors	1,811	17.9	359	22.2
Bachelors: HR	975	9.6	148	9.1
Bachelors: Business (not HR)	1,988	19.7	315	19.5
Bachelors: Social science	699	6.9	115	7.1
Bachelors: Other	1,174	11.6	199	12.3
Masters +: HR	1,570	15.5	211	13
Masters +: Business (not HR)	1,249	12.4	169	10.4
Masters +: Social science	243	2.4	36	2.2
Masters +: Other	404	4	66	4.1
Has other non-HRCI certification(s)?				
No	9,701	95.9	1,543	95.4
Yes	415	4.1	75	4.6
Employment sector				
For profit	6,756	68.5	973	61.9
Not-for-profit	1,853	18.8	355	22.6
Public sector	1,258	12.7	243	15.5
Industry				
Accommodation and Food Services	241	2.4	46	2.8
Educational Services	706	7.1	130	8
Finance and Insurance	842	8.5	119	7.4
Health Care and Social Assistance	1,475	14.9	268	16.6
Manufacturing	1,451	14.6	229	14.2
Professional Scientific/Technical Services	569	5.7	86	5.3
Retail and Trade	503	5.1	75	4.6
Utilities	200	2	42	2.6
Other	3,932	39.6	623	38.5

(continued on next page)

Table 3. Composition of Samples – Categorical Variables (continued)

Variable	Career Survey Sample		Merged Sample	
	N	%	N	%
HR focus				
Generalist	7,183	72.4	1,189	73.5
Specialist	2,736	27.6	429	26.5

Job/Seniority Level				
Junior-level independent contributor	580	4.8	67	4.1
Senior-level independent contributor	4,000	32.8	685	42.3
Supervisor	1,119	9.2	204	12.6
Manager	864	7.1	126	7.8
Executive	1,880	15.4	299	18.5
Unknown	3,765	30.8	237	14.6

Note. Groups that appear in bold, italic font served as referent groups when fitting regression models with control variables.

Table 4. Composition of Analysis Samples – Quantitative Variables

Variable	Career Survey Sample			Merged Sample		
	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
Age	9,725	42.4	10.1	1,333	41.9	10.1
Years since Highest Educational Degree	10,116	14.0	10.2	1,382	13.7	10.1
Years in HR	9,919	13.9	7.8	1,359	13.6	7.6
Number of Organizations Worked For	9,919	2.9	1.9	1,359	2.9	1.8
Current Organizational Tenure	9,919	7.7	7.4	1,359	7.2	6.7
Size of Organization	9,833	11,741	24,657	1,349	11,814	24,745
Size of HR Department	9,581	75.4	184.1	1,302	72.9	179.1

Descriptives and Correlations Among Outcome Variables

Given the differential amounts of missing data across outcomes (e.g., some were available only for those with supervisor survey data), we used full-information maximum likelihood (FIML; cf. Enders, 2010) to estimate the means, standard deviations, and correlations for each outcome variable (see Table 5) and generated bootstrap confidence intervals (based on 1,000 bootstrapped samples) to test the significance of the correlations using Mplus (Muthén & Muthén, 1998-2012). Note that employability-related outcomes (RQ1) and outcome variables involving pre- and post-certification components (RQ2b, RQ4c) were excluded from these analyses because (a) data on employability outcomes were available only for those individuals who reported being employed full-time in an HR position and (b) data involving post-certification responses were not available for non-certificants.

Table 5. Descriptive Statistics and Correlations among Outcome Variables

Outcome	M	SD	Correlations								
			1	2	3	4	5	6	7	8	
1 Promotion Rate (RQ2a)	.29	.23									
2 Opportunities for Growth (RQ3)	3.77	.93	.11*								
3 Current Annual Income (RQ4a)	\$82,046.33 ^a	\$35,759.74 ^a	-.03*	.11*							
4 Income Growth (RQ4b)	\$2,644.02 ^a	\$2,763.61 ^a	.42*	.10*	.47*						
5 Career Satisfaction (RQ5)	3.82	.64	.11*	.43*	.33*	.25*					
6 Overall Job Performance (RQ6a)	4.42	.47	.02	.06*	.15*	.12*	.21*				
7 Strategic HR Performance (RQ6b)	3.99	.81	.01	.06*	.16*	.11*	.17*	.73*			
8 Future Potential (RQ7)	3.18	.87	.06*	.03	.06*	.11*	.13*	.68*	.60*		
9 HR Technical Expertise (RQ8)	3.63	.82	-.11*	.05*	.31*	.07*	.23*	.55*	.61*	.44*	

Note. The total number of cases entering into the FIML analysis was 9,919. *95% bootstrapped confidence interval did not include zero (based on 1,000 bootstrap samples).

^a Estimate not based on FIML due to the difficulty of model convergence when variables being compared involve very different scale types (e.g., Likert-type scale and continuous income scale).

Table 5 reveals a high level of convergence among the supervisor-rated criteria (performance, potential, and HR expertise) and more moderate relations between career satisfaction and various factors that have tended to relate to career satisfaction depending on aspects of work people may differentially value (e.g., promotions, growth opportunities, compensation).

Evaluation of Research Questions

RQ1a: Are organizations requiring or preferring an HR certification when hiring HR professionals?

Among the 1,618 supervisors surveyed, 17.0% indicated their organization requires HR certification for some of its HR positions, and 3.1% indicated their organization requires HR certification for all of its HR positions. Narrowing to only the 1,563 supervisors who said their organization does not require HR certification for all of its HR positions, 53.4% indicated their organization prefers HR certification for some of its positions, and 12.7% indicated their organization prefers HR certification for all of its HR positions.

RQ1b: Are non-certified HR professionals less likely to be employed full-time in an HR-related profession than certified HR professionals?

A total of 12,208 career survey respondents provided an answer to the first question on the survey regarding whether or not they were employed full-time as an HR professional. Overall, 31.1% of 3,566 non-certificants reported not being employed full-time as an HR professional, whereas only 10.4% of 5,645 PHR® certificants and 13.2% of 2,997 SPHR® certificants reported not being employed full-time as an HR professional. (All of these differences are statistically significant, which is not surprising given the very large sample sizes.) A follow-up examination of reasons why these individuals were not employed full-time as HR professionals revealed that 69.1% of the non-certificants indicated that their lack of full-time employment as an HR professional was for reasons not of their own choosing. In contrast, only 50.6% of PHR®'s and 47.0% of SPHR®'s who reported not being employed full-time as an HR professional indicated that it was for reasons not of their own choosing. Taken together, these findings suggest that non-certificants are less likely to be employed full-time as an HR professional relative to PHR® and SPHR® certificants, and that their lack of full-time employment is more likely to be involuntary.

RQ2a: Have certified HR professionals advanced in their careers more quickly than non-certified HR professionals?

Regression analyses revealed significant differences between the promotion rates of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of promotion rate, $F(2, 8,983) = 45.86, p < .05$. However, no significant differences were found between non-certificants and HR certificants on promotion rate after accounting for all control variables, $F_{inc}(2, 8,946) = 2.17, ns$. Table 6 summarizes regression results for promotion rate (as well as for other outcomes to be discussed in the sections that follow), focusing only on the model intercepts, regression coefficients for HR certification status, and model R s.⁷

⁷ For the sake of parsimony, we report regression coefficients only for the model intercept and HR certification variables in Table 6. For the sake of completeness, we have included regression coefficients for all model variables (HR certification status and all control variables) in an appendix.

Table 6. Summary of Regression Results

Outcome	N	Model Coefficients						Model Rs			
		HR Cert Status Only (M1)			HR Cert Status + Model All Controls (M3)			M1	M2	M3	ΔR_{M3-M2}
		Intercept	b_{PHR}	b_{SPHR}	Intercept	b_{PHR}	b_{SPHR}				
Promotion Rate (RQ2a)	8,986	0.307	0.002	-0.050*	0.275	0.004	0.014	.10*	.40*	.40*	< .01
Opportunities for Growth (RQ3)	8,986	4.09	-0.45*	-0.35*	3.83	-0.21*	-0.18*	.19*	.28*	.29*	.01*
Current Annual Income (RQ4a)	8,738	\$69,473	\$4,972*	\$39,946*	\$63,425	\$4,547*	\$19,711*	.45*	.66*	.68*	.02*
Income Growth (RQ4b)	8,630	\$2,304	\$360*	\$778*	\$1,670	\$292*	\$938*	.10*	.45*	.46*	.01*
Career Satisfaction (RQ5)	8,986	3.65	0.16*	0.36*	3.61	0.15*	0.22*	.20*	.33*	.35*	.02*
Overall Job Performance (RQ6a)	1,478	4.23	0.19*	0.29*	4.27	0.18*	0.25*	.19*	.25*	.29*	.04*
Strategic HR Performance (RQ6b)	1,319	3.79	0.22*	0.41*	3.76	0.22*	0.35*	.17*	.23*	.26*	.03*
Future Potential (RQ7)	1,478	2.98	0.21*	0.30*	2.87	0.23*	0.36*	.11*	.26*	.28*	.02*
HR Technical Expertise (RQ8)	1,476	3.23	0.32*	0.81*	3.35	0.28*	0.49*	.33*	.47*	.50*	.03*

Note. n = Sample size for the given regression analyses. Intercept = Model intercept. b_{PHR} = Raw regression coefficient for dummy variable coded as 1 = PHR®, 0 = Not PHR®. b_{SPHR} = Raw regression coefficient for dummy variable coded 1 = SPHR®, 0 = Not SPHR®. M1 = Model containing HR certification status dummy variables only. M2 = Model containing all control variables only. M3 = Model containing HR certification status dummy variables and all control variables. ΔR_{M3-M2} = Change in multiple R when HR certification status dummy variables were added to the model containing all control variables. *Statistically significant ($p < .05$).

As a follow-up to the analyses above, we also fitted moderated regression models to determine whether the relation between certification status and promotion rate differed as a function of the individual participant’s employment sector (i.e., private sector vs. public sector vs. non-profit) or HR focus (i.e., HR specialist vs. HR generalist). Adding employment sector × HR focus certification status interaction terms to the model containing HR certification status and all control variables revealed no significant increment in model fit, $F_{inc}(4, 8,942) = 1.09, ns$. Furthermore, adding HR focus × HR certification status interaction terms to the model containing HR certification status and all control variables revealed no significant increment in model fit, $F_{inc}(2, 8,944) = 0.60, ns$.

RQ2b Have certified HR professionals advanced in their careers more quickly after becoming certified relative to before their certification?

To evaluate this research question, within-group *t*-tests were performed that compared (a) the pre- and post-certification promotion rates of PHR[®]s, and (b) the pre- and post-certification promotion rates of SPHR[®]s. These *t*-tests revealed significant differences between pre- and post-certification promotion rates for PHR[®]s, $t(2,782) = 15.16, p < .05$ and SPHR[®]s, $t(1,885) = 11.88, p < .05$. However these differences were in the opposite direction of what was expected, with PHR[®] promotion rates being 0.137 scale point lower post-certification compared to pre-certification, and SPHR[®] promotion rates being 0.135 scale point lower post-certification compared to pre-certification. Table 7 provides the observed means and standard deviations for pre- and post-certification promotion rates for reference. (Income growth results will be described in a later section.)

Table 7. Summary of Pre- and Post-Certification Promotion and Income Growth Rates

Outcome/Group	<i>n</i>	Pre-Certification		Post-Certification	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Promotion Rate (RQ2b)					
PHR [®] s	2,783	0.402	0.378	0.265	0.282
SPHR [®] s	1,886	0.363	0.417	0.229	0.244
Income Growth (RQ4c)					
PHR [®] s	3,330	\$1,379	\$3,819	\$4,051	\$4,616
SPHR [®] s	1,953	\$3,594	\$6,860	\$3,884	\$5,898

RQ3 Have certified HR professionals had more opportunities for professional growth than non-certified HR professionals?

Regression analyses revealed significant differences between the professional growth opportunities of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of professional growth opportunities, $F(2, 8,983) = 171.40, p < .05$. Furthermore, the differences between non-certificants and HR certificants’ professional growth opportunities remained significant even after accounting for all control variables, $F_{inc}(2, 8,945) = 24.42, p < .05$. Table 6 summarizes regression results for the professional growth opportunities outcome.

As shown in Table 6, professional growth opportunities were estimated to be 0.21 scale point lower for PHR[®] certificants than non-certificants and 0.18 scale point lower for SPHR[®]

certificants than non-certificants, after accounting for all control variables. To help put the magnitude of these effects in context, we also calculated them in terms of standard deviation units on the professional growth opportunity scale ($M = 3.77$, $SD = 0.93$ within the regression analysis sample). Specifically, professional growth opportunities were estimated to be 0.22 standard deviation lower for PHR[®] certificants than non-certificants and 0.29 standard deviation lower for SPHR[®] certificants than non-certificants, after accounting for all control variables.

To be clear on how to interpret these regression results, the intercept in the model with all control variables (3.83; from Table 6) reflects the expected professional growth opportunity rating for a respondent defined by the referent values: (a) non-certificant, (b) works at a for-profit organization, (c) holds a bachelor's degree in business (not HR), (d) holds no other HR certifications, (e) serves in an HR generalist role, (f) holds an advanced/senior level HR position, (g) works in the health care industry, (h) is Caucasian and female, and (i) falls at the mean on all quantitative control variables cited in Table 4 (e.g., size of organization, size of HR department, years from graduation, etc.).⁸ Thus, the regression coefficients for the PHR[®] and SPHR[®] variables shown in Table 6 (i.e., 0.21, and 0.18, respectively) simply reflect the predicted deviations from the intercept on the professional growth opportunity scale.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed no significant increment in model fit for either variable, $F_{inc}(4, 8,941) = 1.26$, ns for employment sector and $F_{inc}(2, 8,943) = 0.44$, ns for HR focus, respectively.

RQ4a Do certified HR professionals have higher annual incomes than non-certified HR professionals?

Regression analyses revealed significant differences between the current annual income of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of current income, $F(2, 8,735) = 1093.06$, $p < .05$. Furthermore, the differences between non-certificants and HR certificants' current annual income remained significant, even after accounting for all control variables, $F_{inc}(2, 8,698) = 255.17$, $p < .05$. Table 6 summarizes regression results for current annual income.

As shown in Table 6, current annual income was estimated to be \$4,547 higher for PHR[®] certificants than non-certificants and \$19,712 higher for SPHR[®] certificants than non-certificants, after accounting for all control variables. The intercept in the model with all control variables (\$63,425) reflects the expected current annual income for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., \$4,547 and \$19,712, respectively) simply reflect the predicted deviations from that intercept in dollars.

⁸ For this research question, we also included one additional control variable that reflected the amount of time between the start of one's HR career and the survey date for non-certificants, and the amount of time between the one's certification date and the survey data for HR certificants. This allowed us to control for differences in the amount of time participants could have experienced opportunities for professional growth. This was necessary due to the way the survey question was worded (reflect on entire HR career for non-certificants; reflect only on post-certification HR career for certificants).

As a follow-up to the analyses above, we also fitted moderated regression models to determine if the relation between certification status and current annual income differed as a function of the individual participant’s employment sector or HR focus. Although adding employment sector × HR certification status interaction terms to the model containing HR certification status and all control variables revealed a significant increment in model fit, $F_{inc}(4, 8,694) = 10.88, p < .05$, the resulting change in model R was very small ($\Delta R < .002$).⁹ Adding HR focus × HR certification status interaction terms to the model containing HR certification status and all control variables revealed no significant increment in model fit, $F_{inc}(2, 8,696) = 0.38, ns$.

Table 8 summarizes moderated regression results for the model containing employment sector × HR certification status interaction terms – focusing only on the model intercepts, regression coefficients for HR certification status, employment sector, and their interaction terms. As evidenced in Table 8, the nature of the interaction is such that the differences between SPHR® certificants’ and non-certificants’ current annual income appears to be greater among private sector HR professionals than among public sector HR professionals.

Table 8. Interaction between Employment Sector and HR Certification Status for Predicting Current Annual Income

Model parameter	Estimate
Intercept	\$62,269
Certification Status	
PHR®	\$5,304*
SPHR®	\$22,914*
Employment Sector ^a	
Not-for-profit	-\$4,050*
Public sector	-\$7,441*
Interaction Terms	
PHR × Not-for-profit	-\$2,675
SPHR × Not-for-profit	-\$7,986*
PHR × Public sector	-\$1,166
SPHR × Public sector	-\$12,499*

Note. Sample size = 8,738. ^aThe referent group for employment sector was private sector organizations. Estimate = Raw regression coefficient for the given model parameter for a model containing HR certification status, all control variables, and the employment sector × HR certification status interaction terms. *Statistically significant ($p < .05$).

RQ4b Have certified HR professionals experienced greater growth in their annual income than non-certified HR professionals?

Regression analyses revealed significant differences between the annual income growth of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of income growth, $F(2, 8,627) = 40.93, p < .05$. Furthermore, the differences between non-certificants’ and HR certificants’ annual income growth remained significant, even after accounting for all control variables, $F_{inc}(2, 8,590) = 60.13, p < .05$. Table 6 summarizes regression results for the annual income growth outcome.

⁹ With very large sample sizes such as those used here, it is possible for even very small increments in model fit to be statistically significant (Cohen, 1988).

As shown in Table 6, annual income growth was estimated to be \$292 higher per year for PHR[®] certificants than non-certificants and \$938 higher per year for SPHR[®] certificants than non-certificants, after accounting for all control variables. The intercept in the model with all control variables (\$1,670) reflects the expected yearly income growth for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., \$292 and \$938, respectively) simply reflect the predicted deviations from that intercept in dollars.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed no significant increment in model fit for either variable, $F_{inc}(4, 8,586) = 2.27$, *ns* for employment sector and $F_{inc}(2, 8,588) = 1.56$, *ns* for HR focus, respectively.

RQ4c Have certified HR professionals experienced greater growth in their compensation after becoming certified relative to before their certification?

To evaluate this research question, within-group *t*-tests were performed that compared the (a) pre-certification and post-certification annual income growth of PHR[®] certificants, and (b) the pre-certification and post-certification annual income growth of SPHR[®] certificants. These *t*-tests revealed significant differences between pre- and post-certification annual income growth for PHR[®] certificants, $t(3,329) = 24.60$, $p < .05$, but no significant differences for SPHR[®] certificants, $t(1,952) = 1.30$, *ns*. Specifically, PHR[®] certificants' annual income growth was estimated to be \$2,672 per year higher post-certification compared to pre-certification. Table 7 provides the means and standard deviations for pre- and post-certification annual income growth for reference.

RQ5 Are certified HR professionals more satisfied with their HR careers than non-certified HR professionals?

Regression analyses revealed significant differences between the career satisfaction of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of career satisfaction, $F(2, 8,983) = 189.44$, $p < .05$. Furthermore, the differences between non-certificants' and HR certificants' career satisfaction remained significant, even after accounting for all control variables, $F_{inc}(2, 8,946) = 62.79$, $p < .05$. Table 6 summarizes regression results for the career satisfaction outcome.

As shown in Table 6, career satisfaction was estimated to be 0.15 scale point higher for PHR[®] certificants than non-certificants and 0.22 scale point higher for SPHR[®] certificants than non-certificants, after accounting for all control variables. To help put the magnitude of these effects in context, we also calculated them in terms of standard deviation units on the career satisfaction scale ($M = 3.83$, $SD = 0.63$ within the regression analysis sample). Specifically, career satisfaction scores were estimated to be 0.23 standard deviation higher for PHR[®] certificants than non-certificants and 0.34 standard deviation higher for SPHR[®] certificants than non-certificants, after accounting for all control variables.

The intercept in the model with all control variables (3.61) reflects the expected career satisfaction for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., 0.15 and

0.22, respectively) simply reflect the predicted deviations from that intercept in career satisfaction rating scale points.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed no significant increment in model fit for either variable, $F_{inc}(4, 8,942) = 2.08$, *ns* for employment sector and $F_{inc}(2, 8,944) = 1.87$, *ns* for HR focus, respectively.

RQ6a Do certified HR professionals perform better on the job than non-certified HR professionals?

Regression analyses revealed significant differences between the supervisor-rated overall job performance of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of job performance, $F(2, 1,475) = 28.96$, $p < .05$. Furthermore, the differences between non-certificants' and HR certificants' overall job performance remained significant, even after accounting for all control variables, $F_{inc}(2, 1,438) = 17.40$, $p < .05$. Table 6 summarizes regression results for the overall job performance outcome.

As shown in Table 6, supervisor-rated overall job performance was estimated to be 0.18 scale point higher for PHR[®] certificants than non-certificants and 0.25 scale point higher for SPHR[®] certificants than non-certificants, after accounting for all control variables. To help put the magnitude of these effects in context, we also calculated them in terms of standard deviation units on the overall job performance scale ($M = 4.42$, $SD = 0.47$ within the regression analysis sample). Specifically, overall job performance ratings were estimated to be 0.39 standard deviation higher for PHR[®] certificants than non-certificants and 0.53 standard deviation higher for SPHR[®] certificants than non-certificants, after accounting for all control variables.

The intercept in the model with all control variables (4.28) reflects the expected overall job performance rating for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., 0.18 and 0.25, respectively) simply reflect the predicted deviations from that intercept in overall job performance rating scale points.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed no significant increment in model fit for either variable, $F_{inc}(4, 1,434) = 1.18$, *ns* for employment sector and $F_{inc}(2, 1,436) = 1.79$, *ns* for HR focus, respectively.

RQ6b Do certified HR professionals perform better on strategic HR tasks than non-certified HR professionals?

Regression analyses revealed significant differences between the supervisor-rated strategic HR performance of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of strategic HR performance, $F(2, 1,316) = 18.67$, $p < .05$. Furthermore, the differences between non-certificants' and HR certificants' strategic HR performance remained significant, even after accounting for all control variables, $F_{inc}(2, 1,279) = 9.28$, $p < .05$. Table 6 summarizes regression results for the strategic HR performance outcome.

As shown in Table 6, supervisor-rated strategic HR performance was estimated to be 0.22 scale point higher for PHR[®] certificants than non-certificants and 0.35 scale point higher for SPHR[®] certificants than non-certificants, after accounting for all control variables. To help put the magnitude of these effects in context, we also calculated them in terms of standard deviation units on the strategic HR performance scale ($M = 4.04$, $SD = 0.81$ within the regression analysis sample). Specifically, strategic HR performance ratings were estimated to be 0.27 standard deviation higher for PHR[®] certificants than non-certificants and 0.44 standard deviation higher for SPHR[®] certificants than non-certificants, after accounting for all control variables.

The intercept in the model with all control variables (3.76) reflects the expected strategic HR performance rating for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., 0.22 and 0.35, respectively) simply reflect the predicted deviations from that intercept in strategic HR performance rating scale points.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed no significant increment in model fit for either variable, $F_{inc}(4, 1,275) = 0.57$, *ns* for employment sector and $F_{inc}(2, 1,277) = 1.32$, *ns* for HR focus, respectively.

RQ7 Are certified HR professionals viewed as having more potential for higher level positions than non-certified HR professionals?

Regression analyses revealed significant differences between the supervisor-rated future potential of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of future potential, $F(2, 1,475) = 8.83$, $p < .05$. Furthermore, the differences between non-certificants' and HR certificants' future potential remained significant, even after accounting for all control variables, $F_{inc}(2, 1,438) = 9.59$, $p < .05$. Table 6 summarizes regression results for the future potential outcome.

As shown in Table 6, supervisor-rated future potential was estimated to be 0.23 scale point higher for PHR[®] certificants than non-certificants and 0.35 scale point higher for SPHR[®] certificants than non-certificants, after accounting for all control variables. To help put the magnitude of these effects in context, we also calculated them in terms of standard deviation units on the future potential scale ($M = 3.19$, $SD = 0.87$ within the regression analysis sample). Specifically, future potential ratings were estimated to be 0.27 standard deviation higher for PHR[®] certificants than non-certificants and 0.41 standard deviation higher for SPHR[®] certificants than non-certificants, after accounting for all control variables.

The intercept in the model with all control variables (2.87) reflects the expected future potential rating for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., 0.23 and 0.35, respectively) simply reflect the predicted deviations from that intercept in future potential rating scale points.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed no significant increment in model fit for either variable, $F_{inc}(4, 1,434) = 0.33$, *ns* for employment sector and $F_{inc}(2, 1,436) = 0.37$, *ns* for HR focus, respectively.

RQ8 Are certified HR professionals rated as having more expertise in core HR bodies of knowledge than non-certified HR professionals?

Regression analyses revealed significant differences between the supervisor-rated HR technical expertise of non-certificants and HR certificants based on a model that contained HR certification status as the sole predictor of HR expertise, $F(2, 1,473) = 92.10, p < .05$. Furthermore, the differences between non-certificants' and HR certificants' HR expertise remained significant, even after accounting for all control variables, $F_{inc}(2, 1,436) = 24.19, p < .05$. Table 6 summarizes regression results for the future potential outcome.

As shown in Table 6, supervisor-rated HR expertise was estimated to be 0.28 scale point higher for PHR[®] certificants than non-certificants and 0.49 scale point higher for SPHR[®] certificants than non-certificants after accounting for all control variables. To help put the magnitude of these effects in context, we also calculated them in terms of standard deviation units on the HR expertise scale ($M = 3.64, SD = 0.83$ within the regression analysis sample). Specifically, HR expertise ratings were estimated to be 0.34 standard deviation higher for PHR[®] certificants than non-certificants and 0.59 standard deviation higher for SPHR[®] certificants than non-certificants, after accounting for all control variables.

The intercept in the model with all control variables (3.35) reflects the expected HR technical expertise rating for a non-certificant respondent defined by membership in all of the referent groups highlighted in Table 3, as well as falling at the mean of all quantitative control variables cited in Table 4. Thus, the regression coefficients for the PHR[®] and SPHR[®] variables (i.e., 0.28 and 0.49, respectively) simply reflect the predicted deviations from that intercept in HR expertise scale points.

Follow-up analyses to determine if the relation between certification status and professional growth opportunities differed as a function of the individual participant's employment sector or HR focus revealed a significant increment in model fit for employment sector, $F_{inc}(4, 1,432) = 2.39, p < .05$ but the resulting change in model R was very small ($\Delta R < .006$). There was no significant increment in model fit for HR focus, $F_{inc}(2, 1,434) = 2.49, ns$ for HR focus, respectively.

Table 9 summarizes moderated regression results for the model containing employment sector \times HR certification status interaction terms, focusing only on the model intercepts, regression coefficients for HR certification status, employment sector, and their interaction terms. As shown in Table 9, the nature of the interaction is such that the differences between certificants' and non-certificants' levels of perceived HR expertise, as rated by their supervisors, were much more pronounced in the public sector than in the private- and not-for-profit sectors. More specifically, the HR expertise of non-certificants was rated much lower in the public sector than in the other employment sectors. In contrast, HR certificants' level of expertise was rated comparably regardless of their employment sector.

Table 9. Interaction between Employment Sector and HR Certification Status for Predicting Level of HR Technical Expertise

Model parameter	Estimate
Intercept	3.44

Certification Status	
PHR®	0.19*
SPHR®	0.39*
Employment Sector ^a	
Not-for-profit	-0.14
Public sector	-0.37*
Interaction Terms	
PHR × Not-for-profit	0.06
SPHR × Not-for-profit	0.15
PHR × Public sector	0.43*
SPHR × Public sector	0.32

Note. Sample size = 1,476. ^aThe referent group for employment sector was private sector organizations. Estimate = Raw regression coefficient for the given model parameter for a model containing HR certification status, all control variables, and the employment sector × HR certification status interaction terms. *Statistically significant ($p < .05$).

Discussion

As noted in the introduction, very little research has explored the criterion-related validity of HR certification. Indeed, Aguinis and Lengnick-Hall (2012) cited the lack of such validity evidence as a critical gap in the research literature regarding HR certification. The current study represents arguably the largest, most comprehensive examination of the criterion-related validity of HR certification ever conducted, not only in terms of number of individuals sampled, but also in the number of outcomes examined and the number of potential explanatory factors controlled. As such, the current study has helped to fill a critical gap in the scientific knowledge base regarding the criterion-related validity of HR certification.

The results of this study suggest that HR certification, specifically PHR® or SPHR® certification, is positively associated with numerous outcomes of value to HR professionals and the organizations that employ them. Although the magnitude of association might be described as small to moderate in most cases after accounting for myriad control variables, the positive association was persistent across a diverse set of criteria. Overall, such findings bode well for individuals who invest the time and money to obtain a PHR® and SPHR® certification, as well as the organizations who consider PHR® and SPHR® certification when considering HR professionals for employment.

Although findings were generally positive, some outcomes did show little, or even negative, relation with HR certification status—namely, promotion rate and opportunities for professional growth. We find these results surprising and hypothesize several possible explanations that could be tested in future research. First, we know that a relatively large percentage of the certificants earned their PHR® or SPHR® certification fairly recently (13% within one year, 25% within two years, and 35% within three years of the career survey launch date). These certificants may have had limited time for any positive benefits associated with certification, such as a promotion or professional growth opportunities, to manifest. Thus, their responses to questions about post-certification promotions and professional growth opportunities may accurately reflect little change from their pre-certification status. Future research could examine whether the relations between certification status and these two research outcomes differ for certificants who have been certified longer.

Second, the number of available promotion and growth opportunities may decline (or be perceived as declining) at some point in most career paths. If so, then to the extent HR certificants, as a group, are farther along in their HR careers when they earn their certification (given experience requirements associated with certification), relative to non-certificants as a group, they may be more likely to have reached the point of declining opportunities. (Keep in mind that we controlled for job level and HR experience when conducting the analyses.) Future research could examine whether within-person relations between tenure in one's HR career and promotion rate or perceived growth opportunities decline across time.

Third, the results could be an artifact of how these outcomes were defined for certificants and non-certificants. Recall that HR certificants were asked to evaluate opportunities for professional growth since receiving their certification, whereas non-certificants were asked to evaluate opportunities for professional growth since the start of their HR career. All else being equal, non-certificants will have had more opportunities for growth simply because the amount of time since the start of their HR career is longer than the amount of time that has passed since HR certificants received their certification. We attempted to account for this issue by adding a control variable reflecting the amount of time between the start of one's HR career and the survey date for non-certificants, and the amount of time between the one's certification date and the survey date for HR certificants. This allowed us to control for differences in the amount of time participants actually *could have* experienced opportunities for growth. Despite this additional control, a negative relation was still found between HR certification status and opportunities for professional growth. We therefore view this last explanation as unlikely.

Limitations and Suggestions for Future Research

Despite the positive findings, we would like to discuss several limitations that set the stage for our suggestions for future research. These limitations regard issues of (a) causality (b) generalizability, (c) levels of analysis, (d) measurement issues, and (e) unanswered questions.

Causality

We urge caution in interpreting these findings in a causal manner—that is, claiming that obtaining an HR certification leads certificants to experience more positive outcomes. Given the cross-sectional nature of the data, as well as the nature of the models examined, we cannot completely rule out reverse causality or alternative explanations for the observed relations. To establish causality, three conditions must be present: (a) the predictor (in this case HR certification status) must temporally precede the criterion (in this case the outcomes examined in this study), (b) the predictor must be reliably correlated with the criterion, and (c) the predictor-criterion relation must not be explained by other causes (Antonakis, Bendahan, Jacquart, & Lalive, 2010). We believe the current study meets the second condition and partially meets the third condition for establishing causality. Below, we acknowledge ways in which the study does not meet the conditions for establishing causality and offer some ideas for future research to address these issues.

With regard to the first condition, that the predictor must temporally precede the criterion, there were several outcomes for which this condition was not satisfied. This is largely due to the cross-sectional nature of the data. For example, consider the career satisfaction outcome. Although HR certificants certainly received their HR certification prior to our asking them about their current level of career satisfaction, we do not know what their level of career satisfaction was before receiving their certification. Therefore, we cannot definitively state that their career satisfaction was lower prior to certification and improved as a result of obtaining an HR

certification. This observation also raises the interesting question of how long it takes for HR certification to have any effect on valued outcomes. Logically, consequences stemming from earning an HR certification would not necessarily occur immediately upon receiving the certification. While certification likely leads to an immediate change in the certificant's level of HR expertise, there likely is a time lag before consequences manifest in other outcomes. In fact, we raised this point earlier when offering alternate explanations for the negative and null findings related to promotion and professional growth opportunities. The cross-sectional nature of our data makes it difficult to address this question. Future HR certification research could examine the length of time that typically passes before the benefits of HR certification "kick in" for different outcomes, and the variables that impact this time lag.

For the third condition, our extensive use of control variables partially fulfills the condition for ruling out alternate explanations. We were able to account for factors such as differences between certificants and non-certificants in education level, job level, HR experience, employer size, industry, and so on. That said, we acknowledge one key difference between certificants and non-certificants that we could not control, namely, differences across individuals in the motives, values, abilities, or other personal qualities (e.g., self-efficacy) that lead to a choice to pursue HR certification. For example, one alternative explanation for the positive relation between HR certification and job performance is that stronger performers tend to be more conscientious and achievement-oriented than low performers (Oswald & Hough, 2010). HR professionals who are more conscientious and achievement-oriented may also be more likely to seek an HR certification. Thus, the relation between HR certification status and job performance outcomes in this study *could* reflect unmodeled relations among individual qualities (conscientiousness or achievement orientation) and the choice to seek an HR certification and job performance. We do not have the data necessary to rule out this potential explanation. It is worth noting that most credentialing bodies do not possess the necessary data to rule out this alternative explanation, so the challenge is not unique to the present study.

The issue just described is a variation on sample selection bias originally discussed in the context of econometric models and since extended to models in other disciplines (Antonakis et al., 2010; Heckman, 1979). The notion is that for models that regress an outcome solely on a predictor of interest (e.g., HR certification status)—the approach we used in this study—the regression coefficient for that predictor can be biased if it is related to a factor not included in the model. For example, by regressing job performance solely on HR certification status, the resulting coefficients are biased to the extent that other factors related to who chooses to obtain an HR certification were not included in the model. Although our extensive use of control variables ameliorates this potential bias to some degree, an alternative approach would be to fit a two-stage regression model (a so-called "Heckman model") by first modeling the *choice* to pursue HR certification and then using a function of one's predicted probability of choosing to be certified and one's actual HR certification status as predictors of the outcome of interest. Carrying out this strategy requires (a) knowledge and measures of factors that drive who chooses to pursue HR certification (e.g., conscientiousness, achievement orientation, self-efficacy) and understanding which of those relate to outcomes of interest and which ones do not (i.e., the issue of identifying appropriate instrumental variables), and (b) having this information for both certificants and non-certificants. It was beyond the scope of the present study to gather and analyze all of the necessary data to conduct two-stage regression modeling, but future research could attempt to do so. The advantage of this strategy is that it attempts to limit the control variables to those that are unrelated to the outcome of interest, thus leaving more variance in the outcome to be predicted by the predictor (in this case, HR certification status). In contrast, the modeling approach used in this study included all control variables for every

outcome, which actually leads to conservative estimates (potentially downwardly biased) of the relations between HR certification status and the outcomes of interest.

Despite the limitations just described, we note that criterion-related validity evidence in other domains, such as pre-employment testing, typically is based on correlations and multiple regression. In other words, criterion-related validity studies in the employment testing arena have historically concerned themselves with correlation, not causation (Sackett et al., 2012), just as in the present study.

To help extend the results of the current study and address causality limitations, we suggest that HR certifying bodies such as HRCI begin building infrastructure to support longitudinal evaluation of the effects of HR certification on valued outcomes, and give more explicit thought to modeling the choice to become certified (to facilitate fitting the two-stage models described above). Doing so would allow certifying bodies to accrue data on HR certificants' pre- and post-certification standing on various outcomes, and thus allow for stronger longitudinal research designs that would position them to make stronger causal statements regarding the effects of HR certification on outcomes of value to HR professionals and their employers.

Generalizability

As noted in the Methods section, given the sample sizes available, we deliberately limited our population of interest to a core population of HR professionals. In doing so, however, we necessarily weakened our ability to generalize this study's findings beyond that core population. As such we recommend caution in generalizing the findings of the current study to (a) HR professionals outside the US; (b) HR professionals working outside of generalist or specialist roles; (c) HR professionals working in consulting, as an academician, in the uniformed military services, or who are self-employed; and (d) other groups of HR professionals that were excluded from the core population of interest in this study (see Table 2).

Besides the caution on generalizing the findings of this study to the groups noted above, another potential limitation regards similarity of the population of survey respondents to the population of full-time HR professionals working in the United States. Although we have detailed demographic information on members of our sample, such detailed demographics do not readily exist for the population of full-time HR professionals as a whole, nor are such data broken down according to certification status. For example, although workforce demographic data certainly are available from the U.S. Bureau of Labor Statistics (BLS) and U.S. Census Bureau (e.g. American Community Survey), such data are tied to numerous HR-related job titles that cannot be easily linked to the individuals in this sample. In hindsight, we would recommend future studies of HR certification collect information on respondents' occupation using occupational codes that exist within BLS or Census framework (e.g., Standard Occupational Classification [SOC] codes). Doing so would allow for more direct comparison of demographic characteristics of the individuals sampled to the broader population of HR professionals.

Level of Analysis

Another limitation of the current study was that we examined only individual-level outcomes. As noted in Lengnick-Hall and Aguinis (2012), an important agenda for future research is to consider the potential impact of HR certification not only on individual-level outcomes, but also on macro-level outcomes such as HR unit effectiveness and reputation within the company. Although this study provided evidence that an HR professional's certification status is positively associated with several individual-level outcomes, the association between HR certification and

macro-level outcomes remains unclear. Such research would necessarily require a different design than the one used in the current study. For example, whereas this study focused on surveying individual HR professionals and their supervisors and on the individual HR professional as the focal entity of interest, research focused on macro-level outcomes may target surveys towards heads of HR departments and the executives to whom they report, with a focus on examining relations between level of representation of HR certificants in an HR department and that department's performance on various department, business unit, or organizational outcomes. Unlike the current study, the focal entity of interest would not be individual HR professionals but entire HR departments.

Measurement Issues

Another potential limitation of this study is that we had respondents self-report a variety of information that was used to create promotion and compensation related criteria (e.g., income at various points in ones' career, number of promotions, and number of years in HR). Though self-report is not as problematic for some types of outcomes (e.g., perceptions of opportunities for career growth, career satisfaction), when it comes to actual promotions and compensation it is possible that respondents may have been inaccurate in their recall of this information. All else being equal, to the extent individuals were not able to accurately recall such information, the strength of relationships observed between these outcomes and HR certification status would be attenuated. Despite this limitation, findings for the compensation related outcomes were still strong, and findings for promotion outcomes, though negative, were in line with findings for the related opportunity for professional growth outcome—which was measured with a great deal of reliability. Furthermore, there is little reason to believe that certificants and non-certificants would be differentially accurate in their recall of this information, and thus, we would not expect this issue to systemically bias results in a manner that clearly favors one group over another.

Another potential limitation involves the distribution of job performance ratings provided by supervisors. Specifically, the mean rating on the job performance composite was 4.42 on a 5-point scale ($SD = 0.47$). This means that a very high proportion of participants' job performance was rated between "performs well" (a "4" on the rating scale) and "demonstrates a real strength" (a "5" on the rating scale). Although supervisor ratings of job performance typically trend towards the high end of the scale for a variety of reasons (e.g., Murphy & Cleveland, 1995), this study's design could have exacerbated this trend. For example, because we relied on participating HR professionals to provide their supervisor's contact information, it is possible they were more likely to provide such information if they believed their supervisor would provide a positive evaluation. Similarly, supervisors might have been more likely to complete the supervisor survey for a subordinate with strong performance. Thus, the general trend for supervisors to provide relatively high ratings could be exacerbated by self-selection into the study. Overall, this would translate into little room on the performance rating composite to find any differences between HR certificants and non-certificants because most ratings are clustered in the upper end of the scale. Given the truncation of the performance rating distribution, it is perhaps even more notable that we did find meaningful differences between HR certificants and non-certificants in terms of their job performance.

Unanswered Questions

As with any large scale survey study, there are numerous questions that might have been answered had more time and resources been available. Although the research questions we posed here were wide ranging, and addressed numerous uncertainties regarding the criterion-related validity evidence for HR certification, the potential for substantial follow-up using the data

gathered as part of this study remain. For example, one key question that the current data could be used to explore is whether (a) a college degree in an HR-field might serve as a viable alternative to HR certification, or (b) the positive association found between HR certification and various outcomes may be moderated by one's education level and degree (see Lengnick-Hall & Aguinis, 2012).

Another example of a question that could be explored with the current data regards examining the criterion-related validity of HR certification test scores relative to HR certification pass/fail status. The purpose of the current study was to examine the latter, not the former. However, while such an analysis would necessarily preclude non-certificants who have never attempted HR certification, the results could shed light on the extent to which the observed correlations were attenuated due to the dichotomous predictor variable. It is possible that the types of expertise reflected in HR certifications such as the PHR[®] and SPHR[®] certifications are more valuable than the results here suggest. It is even possible that employers could accrue more value by considering applicants' scores on PHR[®] and SPHR[®] examination in addition to their pass-fail status. Although this idea runs counter to the notion of being "certified," it recognizes the statistical fact that potentially useful information is lost when dichotomizing a continuous score distribution such as that underlying the PHR[®] and SPHR[®] certifications. As such, we encourage future research to revisit this data set to explore these and other questions.

Summary

As noted above, this study represents a rigorous, comprehensive evaluation of HR certification, and helps fill a void in the research literature on HR certification. It also reinforces the value of HR certification for HR professionals and the organizations that employ them. Like any study, this study has its share of limitations, but we did take several steps to minimize limitations, and suggestions were offered for following-up with future research that will expand on the current effort. We look forward to future research in this area and to extension of the current study's findings.

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Appendix

As noted in the text, this appendix provides full regression results for models that included HR certification status and all control variables as predictors.

Table A.1. Full Regression Model Results for Promotion Rate (RQ2a) and Opportunities for Growth (RQ3)

Intercept/Model Variable	Promotion Rate (RQ2a)		Opportunities for Growth (RQ3)	
	<i>B</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	0.275	0.010	3.825	0.045
Certification Status				
Non-Certificant				
PHR®	0.004	0.006	-0.209*	0.030
SPHR®	0.014*	0.007	-0.183*	0.037
Sex				
Male	0.007	0.006	0.014	0.026
Female				
Race/Ethnicity				
Caucasian				
African-American	-0.013	0.008	-0.062	0.033
Asian	-0.002	0.013	-0.081	0.055
Hispanic	-0.007	0.009	0.038	0.037
Other	0.026*	0.013	0.041	0.057
Level of Education Level/Major				
Bachelors: Business (non-HR)				
Less than Bachelors	0.003	0.008	0.049	0.032
Bachelors: HR	-0.008	0.009	0.015	0.037
Bachelors: Social Science	0.002	0.010	0.014	0.042
Bachelors: Other	0.008	0.008	0.015	0.035
Masters +: HR	0.001	0.008	-0.015	0.033
Masters +: Business (non-HR)	-0.011	0.008	-0.023	0.035
Masters +: Social Science	-0.001	0.015	0.140*	0.064
Masters +: Other	0.001	0.012	0.083	0.053
Has other HR certification(s)				
Yes	0.015	0.012	0.004	0.049
No				
Employment sector				
Private sector				
Not-for-profit	-0.013	0.007	0.063*	0.029
Public sector	-0.003	0.008	-0.035	0.032

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Table A.1. Full Regression Model Results for Promotion Rate (RQ2a) and Opportunities for Growth (RQ3) (continued)

Intercept/Model Variable	Promotion Rate (RQ2a)		Opportunities for Growth (RQ3)	
	<i>B</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Industry				
<i>Health Care and Social Assistance</i>				
Accommodation and Food Services	0.015	0.016	0.079	0.067
Educational Services	-0.002	0.011	0.004	0.046
Finance and Insurance	0.003	0.010	-0.016	0.042
Manufacturing	0.006	0.009	0.044	0.039
Professional Scientific/Technical Services	-0.006	0.012	0.015	0.049
Retail and Trade	-0.004	0.012	0.002	0.052
Utilities	0.026	0.017	0.082	0.073
Other	0.004	0.007	0.026	0.031
HR focus				
Specialist	0.014*	0.005	-0.062*	0.022
<i>Generalist</i>				
Job/Seniority Level				
<i>Senior-level independent contributor</i>				
Junior-level independent contributor	-0.006	0.010	-0.102*	0.043
Supervisor	0.015*	0.007	0.101*	0.032
Manager	0.005	0.008	0.023	0.035
Executive	0.027*	0.007	0.260*	0.028
Unknown	0.017*	0.007	0.158*	0.029
Age	-0.005*	<0.001	-0.005*	0.002
Years since Highest Educational Degree	-0.001*	<0.001	-0.001	0.001
Years in HR	-0.004*	<0.001	-0.007*	0.002
Number of Organizations Worked For	0.001	0.002	0.005	0.007
Current Organizational Tenure	-0.002*	<0.001	-0.005*	0.002
Size of Organization	<0.001	<0.001	0.000	<0.001
Size of HR Department	<0.001*	<0.001	0.000*	<0.001
Time since Start of HR Career or HR Cert ^a			0.034*	0.002
Model Fit Statistics				
	<i>R</i> = .40*, <i>F</i> (39, 8,946) = 44.54, <i>p</i> < .05, <i>n</i> = 8,986		<i>R</i> = .29*, <i>F</i> (40, 8,945) = 20.93, <i>p</i> < .05, <i>n</i> = 8,986	

Note. Intercept = Model intercept. *b* = Raw regression coefficients. *SE* = Standard error of regression coefficient. Groups that appear in bold, italic font served as referent groups when fitting the regression models. All other groups were dummy coded (1 = respondent is a member of the given group, 0 = respondent is not a member of the given group). *R* = Multiple *R* for model with all control variables. ^aThis variable was added as an additional control variable when modeling the opportunities for growth outcome that reflected time since the start of one's HR career for non-certificants, and the time since receiving one's certification for certificants. *Statistically significant (*p* < .05).

Table A.2. Full Regression Model Results for Current Annual Income (RQ4a) and Annual Income Growth (RQ4b)

Intercept/Model Variable	Current Annual Income (RQ4a)		Annual Income Growth (RQ4b)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	\$63,425	\$1,309	\$1,671	\$124
Certification Status				
Non-Certificant				
PHR®	\$4,548*	\$747	\$292*	\$71
SPHR®	\$19,712*	\$935	\$939*	\$88
Sex				
Male	\$5,671*	\$798	\$3	\$75
Female				
Race/Ethnicity				
Caucasian				
African-American	-\$172	\$997	-\$270*	\$94
Asian	\$5,789*	\$1,653	\$8	\$158
Hispanic	\$145	\$1,124	-\$265*	\$106
Other	\$3,272	\$1,700	\$128	\$161
Level of Education/Major				
Bachelors: Business (non-HR)				
Less than Bachelors	-\$8,554*	\$971	-\$362*	\$92
Bachelors: HR	-\$2,138	\$1,106	\$34	\$105
Bachelors: Social Science	\$1,399	\$1,249	\$162	\$118
Bachelors: Other	\$388	\$1,063	\$115	\$100
Masters +: HR	\$6,341*	\$1,006	\$403*	\$95
Masters +: Business (non-HR)	\$6,807*	\$1,072	\$359*	\$101
Masters +: Social Science	\$9,376*	\$1,937	\$854*	\$183
Masters +: Other	\$6,043*	\$1,597	\$89	\$151
Has other non-HRCI HR certification(s)				
Yes	\$12,997*	\$1,489	\$678*	\$141
No				
Employment sector				
Private sector				
Not-for-profit	-\$7,522*	\$887	-\$409*	\$84
Public sector	-\$11,177*	\$963	-\$567*	\$91
Industry				
Health Care and Social Assistance				
Accommodation and Food Services	-\$516	\$2,037	\$72	\$192
Educational Services	-\$1,488	\$1,380	-\$168	\$131
Finance and Insurance	\$7,055*	\$1,270	\$407*	\$120
Manufacturing	\$4,309*	\$1,162	\$200	\$110
Professional Scientific/Technical Services	\$6,302*	\$1,491	\$266	\$141
Retail and Trade	-\$220	\$1,559	-\$306*	\$148
Utilities	\$16,261*	\$2,181	\$886*	\$206
Other	\$3,894*	\$946	\$192*	\$90

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Table A.2. Full Regression Model Results for Current Annual Income (RQ4a) and Annual Income Growth (RQ4b) (continued)

Intercept/Model Variable	Current Annual Income (RQ4a)		Annual Income Growth (RQ4b)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
HR Specialist	-\$731	\$678	-\$48	\$64
<i>HR Generalist</i>				
Job/Seniority Level				
<i>Senior-level independent contributor</i>				
Junior-level independent contributor	-\$5,787*	\$1,288	-\$449*	\$122
Supervisor	\$8,457*	\$952	\$697*	\$90
Manager	\$8,543*	\$1,067	\$584*	\$101
Executive	\$32,014*	\$863	\$1,683*	\$82
Unknown	\$12,897*	\$886	\$796*	\$84
Age	-\$62	\$47	-\$79*	\$4
Years since Highest Educational Degree	\$193*	\$40	-\$4	\$4
Years in HR	\$782*	\$64	-\$54*	\$6
Number of Organizations Worked For	\$1,373*	\$213	\$33	\$20
Current Organizational Tenure	\$411*	\$54	\$18*	\$5
Size of Organization	<\$1*	<\$1	<\$1*	<\$1
Size of HR Department	\$16*	\$2	\$1*	<\$1
Model Fit Statistics	<i>R</i> = .68*, <i>F</i> (39, 8,698) = 190.70, <i>p</i> < .05, <i>n</i> = 8,738		<i>R</i> = .46*, <i>F</i> (39, 8,590) = 59.16, <i>p</i> < .05, <i>n</i> = 8,630	

Note. All values expressed in 2014 U.S. dollars. Intercept = Model intercept. *b* = Raw regression coefficients. *SE* = Standard error of regression coefficient. Groups that appear in bold, italic font served as referent groups when fitting the regression models. All other groups were dummy coded (1 = respondent is a member of the given group, 0 = respondent is not a member of the given group). *R* = Multiple *R* for model with all control variables. *Statistically significant (*p* < .05).

Table A.3. Full Regression Model Results for Career Satisfaction (RQ5) and Overall Job Performance (RQ6a)

Intercept/Model Variable	Career Satisfaction (RQ5)		Overall Job Performance (RQ6a)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	3.608	0.029	4.278	0.058
Certification Status				
Non-Certificant				
PHR®	0.148*	0.017	0.184*	0.036
SPHR®	0.223*	0.021	0.249*	0.044
Sex				
Male	-0.028	0.018	-0.030	0.035
Female				
Race/Ethnicity				
Caucasian				
African-American	-0.167*	0.022	-0.055	0.046
Asian	-0.061	0.037	-0.031	0.080
Hispanic	0.066*	0.025	-0.059	0.052
Other	-0.033	0.038	0.020	0.074
Level of Education/Major				
Bachelors: Business (non-HR)				
Less than Bachelors	-0.036	0.022	0.008	0.039
Bachelors: HR	-0.011	0.025	-0.043	0.047
Bachelors: Social Science	-0.041	0.028	0.029	0.052
Bachelors: Other	-0.076*	0.024	0.009	0.044
Masters +: HR	0.013	0.022	0.042	0.045
Masters +: Business (non-HR)	-0.006	0.024	0.056	0.047
Masters +: Social Science	-0.037	0.043	0.118	0.082
Masters +: Other	0.011	0.035	0.043	0.067
Has other non-HRCI HR certification(s)				
Yes	0.058	0.033	-0.003	0.059
No				
Employment sector				
Private sector				
Not-for-profit	0.037	0.020	-0.031	0.036
Public sector	0.041	0.021	-0.020	0.038
Industry				
Health Care and Social Assistance				
Accommodation and Food Services	0.074	0.045	-0.162*	0.080
Educational Services	-0.061*	0.031	0.055	0.055
Finance and Insurance	0.039	0.028	-0.089	0.054
Manufacturing	0.060*	0.026	-0.138*	0.049
Professional Scientific/Technical Services	0.016	0.033	-0.083	0.064
Retail and Trade	0.013	0.035	0.063	0.067
Utilities	0.071	0.049	-0.044	0.080
Other	0.017	0.021	-0.061	0.039

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Table A.3. Full Regression Model Results for Career Satisfaction (RQ5) and Overall Job Performance (RQ6a) (continued)

Intercept/Model Variable	Career Satisfaction (RQ5)		Overall Job Performance (RQ6a)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
HR Specialist	-0.073*	0.015	-0.026	0.029
<i>HR Generalist</i>				
Job/Seniority Level				
<i>Senior-level independent contributor</i>				
Junior-level independent contributor	-0.154*	0.029	-0.098	0.062
Supervisor	0.106*	0.021	0.083*	0.038
Manager	0.086*	0.024	0.119*	0.047
Executive	0.340*	0.019	0.089*	0.037
Unknown	0.227*	0.020	0.073	0.037
Age	-0.010*	0.001	-0.008*	0.002
Years since Highest Educational Degree	0.003*	0.001	0.001	0.002
Years in HR	0.011*	0.001	0.004	0.003
Number of Organizations Worked For	-0.011*	0.005	-0.002	0.009
Current Organizational Tenure	0.003*	0.001	0.002	0.002
Size of Organization	<0.001	<0.001	<0.001	<0.001
Size of HR Department	<0.001	<0.001	<0.001	<0.001
Model Fit Statistics	<i>R</i> = .35*, <i>F</i> (39, 8,946) = 31.20, <i>p</i> < .05, <i>n</i> = 8,986		<i>R</i> = .29*, <i>F</i> (39, 1,438) = 3.41, <i>p</i> < .05, <i>n</i> = 1,478	

Note. Overall Job Performance is a composite of ratings on several aspects of performance provided by direct supervisors of career survey respondents. Intercept = Model intercept. *b* = Raw regression coefficients. *SE* = Standard error of regression coefficient. Groups that appear in bold, italic font served as referent groups when fitting the regression models. All other groups were dummy coded (1 = respondent is a member of the given group, 0 = respondent is not a member of the given group). *R* = Multiple *R* for model with all control variables. *Statistically significant (*p* < .05).

Table A.4. Full Regression Model Results for Strategic HR Performance (RQ6b) and Future Potential (RQ7)

Intercept/Model Variable	Strategic HR Performance (RQ6b)		Future Potential (RQ7)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Intercept	3.758	0.109	2.872	0.109
Certification Status				
Non-Certificant				
PHR®	0.219*	0.069	0.232*	0.067
SPHR®	0.353*	0.082	0.356*	0.082
Sex				
Male	-0.051	0.063	-0.005	0.065
Female				
Race/Ethnicity				
Caucasian				
African-American	-0.014	0.085	0.050	0.085
Asian	-0.071	0.147	-0.063	0.150
Hispanic	-0.190	0.101	-0.010	0.097
Other	-0.066	0.137	0.020	0.138
Level of Education/Major				
Bachelors: Business (non-HR)				
Less than Bachelors	0.034	0.073	0.008	0.073
Bachelors: HR	-0.089	0.088	-0.115	0.088
Bachelors: Social Science	0.049	0.097	0.099	0.097
Bachelors: Other	-0.031	0.082	0.089	0.082
Masters +: HR	0.028	0.081	0.127	0.083
Masters +: Business (non-HR)	0.077	0.086	0.069	0.087
Masters +: Social Science	0.317*	0.149	0.303*	0.154
Masters +: Other	0.147	0.125	0.061	0.126
Has other non-HRCI HR certification(s)				
Yes	-0.003	0.107	-0.136	0.110
No				
Employment sector				
Private sector				
Not-for-profit	-0.001	0.066	0.006	0.066
Public sector	0.072	0.071	0.058	0.071
Industry				
Health Care and Social Assistance				
Accommodation and Food Services	-0.279	0.143	-0.211	0.149
Educational Services	0.133	0.103	0.117	0.103
Finance and Insurance	-0.026	0.102	-0.099	0.100
Manufacturing	-0.110	0.090	-0.060	0.092
Professional Scientific/Technical Services	0.123	0.116	0.040	0.119
Retail and Trade	0.139	0.121	0.209	0.125
Utilities	-0.036	0.148	-0.160	0.150
Other	0.032	0.072	0.008	0.073

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Table A.4. Full Regression Model Results for Strategic HR Performance (RQ6b) and Future Potential (RQ7) (continued)

Intercept/Model Variable	Strategic HR Performance (RQ6b)		Future Potential (RQ7)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
HR Specialist	-0.031	0.054	-0.109*	0.054
<i>HR Generalist</i>				
Job/Seniority Level				
<i>Senior-level independent contributor</i>				
Junior-level independent contributor	-0.173	0.125	-0.119	0.115
Supervisor	-0.006	0.069	0.181*	0.071
Manager	0.165	0.084	0.189*	0.088
Executive	0.150*	0.066	0.198*	0.069
Unknown	0.096	0.070	0.117	0.070
Age	-0.009*	0.003	-0.018*	0.004
Years since Highest Educational Degree	-0.001	0.003	-0.001	0.003
Years in HR	0.006	0.005	0.002	0.005
Number of Organizations Worked For	-0.002	0.017	-0.011	0.018
Current Organizational Tenure	0.001	0.004	-0.001	0.004
Size of Organization	<0.001	<0.001	<0.001	<0.001
Size of HR Department	<0.001	<0.001	<0.001	<0.001
Model Fit Statistics	<i>R</i> = .26*, <i>F</i> (39, 1,279) = 2.47, <i>p</i> < .05, <i>n</i> = 1,319		<i>R</i> = .28*, <i>F</i> (39, 1,438) = 3.24, <i>p</i> < .05, <i>n</i> = 1,478	

Note. Strategic HR Performance and Future Potential are judgments provided by direct supervisors of career survey respondents. Intercept = Model intercept. *b* = Raw regression coefficients. *SE* = Standard error of regression coefficient. Groups that appear in bold, italic font served as referent groups when fitting the regression models. All other groups were dummy coded (1 = respondent is a member of the given group, 0 = respondent is not a member of the given group). *R* = Multiple *R* for model with all control variables. *Statistically significant (*p* < .05).

Table A.5. Full Regression Model Results for HR Technical Expertise (RQ8)

Intercept/Model Variable	HR Technical Expertise (RQ8)	
	<i>b</i>	<i>SE</i>
Intercept	3.355	0.093
Certification Status		
Non-Certificant		
PHR®	0.280*	0.058
SPHR®	0.491*	0.071
Sex		
Male	0.007	0.056
Female		
Race/Ethnicity		
Caucasian		
African-American	-0.085	0.073
Asian	-0.111	0.129
Hispanic	-0.175*	0.083
Other	0.127	0.118
Level of Education/Major		
Bachelors: Business (non-HR)		
Less than Bachelors	-0.024	0.063
Bachelors: HR	-0.059	0.076
Bachelors: Social Science	-0.072	0.084
Bachelors: Other	-0.003	0.070
Masters +: HR	0.092	0.072
Masters +: Business (non-HR)	0.080	0.075
Masters +: Social Science	0.140	0.132
Masters +: Other	0.046	0.108
Has other non-HRCI HR certification(s)		
Yes	0.025	0.095
No		
Employment sector		
Private sector		
Not-for-profit	-0.049	0.057
Public sector	-0.052	0.061
Industry		
Health Care and Social Assistance		
Accommodation and Food Services	-0.206	0.129
Educational Services	0.126	0.089
Finance and Insurance	-0.212*	0.087
Manufacturing	-0.082	0.079
Professional Scientific/Technical Services	0.069	0.102
Retail and Trade	0.126	0.108
Utilities	0.013	0.129
Other	-0.047	0.063

(continued on next page)

Table A.5. Full Regression Model Results for HR Technical Expertise (RQ8) (continued)

Intercept/Model Variable	HR Technical Expertise (RQ8)	
	<i>b</i>	<i>SE</i>
HR Specialist	-0.289*	0.046
<i>HR Generalist</i>		
Job/Seniority Level		
<i>Senior-level independent contributor</i>		
Junior-level independent contributor	-0.339*	0.099
Supervisor	0.175*	0.061
Manager	0.329*	0.075
Executive	0.377*	0.059
Unknown	0.084	0.060
Age	-0.001	0.003
Years since Highest Educational Degree	0.001	0.003
Years in HR	0.015*	0.004
Number of Organizations Worked For	0.010	0.015
Current Organizational Tenure	0.002	0.003
Size of Organization	<0.001	<0.001
Size of HR Department	<0.001	<0.001
Model Fit Statistics	$R = .50^*$, $F(39, 1,436) = 11.95$, $p < .05, n = 1,476$	

Note. HR Technical Expertise is a composite of ratings on knowledge domains corresponding to the the PHR® and SPHR® bodies of knowledge, with ratings provided by direct supervisors of career survey respondents. Intercept = Model intercept. *b* = Raw regression coefficients. *SE* = Standard error of regression coefficient. Groups that appear in bold, italic font served as referent groups when fitting the regression models. All other groups were dummy coded (1 = respondent is a member of the given group, 0 = respondent is not a member of the given group). *R* = Multiple *R* for model with all control variables. *Statistically significant ($p < .05$).