

Opening the Black Box: Examining the Nomological Network of Work Ability and Its Role in Organizational Research

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The aging of the industrialized workforce has spurred research on how to support people working later in life. Within this context, the concept of work ability, or an employee's ability to continue working in their job, has been introduced as an explanatory mechanism for understanding employee disability, wellbeing, attitudes, and behavior. However, the work ability concept has evolved across disparate literatures with multiple, content-diverse measures and often with little consideration of theory or examination of its nomological network. Using the job demands–resources model as a framework, we present a meta-analytic summary ($k = 247$; $N = 312,987$) of work ability's correlates and potential moderators of these relationships. Taken together, we found consistent negative relationships between job demands and work ability, and consistent positive relationships between job and personal resources and work ability. Work ability was also associated with important job outcomes including job attitudes and behaviors such as absenteeism and retirement. Measures of work ability that include both perceived and objective components generally showed stronger relationships than did exclusively perceptual measures, and occupation type was a significant moderator of certain relations between work ability and its correlates. We supplemented this meta-analysis with a primary data collection to examine differences between perceived work ability and the conceptually similar variables of self-efficacy and perceived fit, demonstrating that perceived work ability can explain incremental variance in job- and health-related variables. Our discussion focuses on the value of the work ability construct for both research and practice and future directions for work ability research.

Keywords: aging workforce, job demands, job resources, retirement, work ability

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As the industrialized workforce continues to age, an estimated 38.2% of the workforce in the United States will be at least 55

years old by 2024 (Toossi, 2015). This trend is a driving factor in the expected decline of the overall labor force participation rate in the United States (61% by 2026; United States Bureau of Labor Statistics, 2017). The aging workforce and low rates of workforce participation place increased strain on retirement systems and other social safety net programs. To address the challenges associated with an aging workforce and lower workforce participation, it is critical to understand how to keep individuals working effectively and participating in the labor market across the life span. Continuing to work can also provide individuals with important benefits, such as financial (Butrica, 2011), psychological (Kulik, Ryan, Harper, & George, 2014; Rohwedder & Willis, 2010; Zhan, Wang, Liu, & Shultz, 2009), and health benefits (Herzog, House, & Morgan, 1991). In addition, organizations can benefit from older employees' positive job attitudes (Ng & Feldman, 2008), depth of job knowledge, and higher rates of organizational citizenship behaviors (Ng & Feldman, 2008).

Research on work ability focuses on extending working careers and promoting workforce participation. As a construct, work abil-

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ity evolved in the field of occupational medicine. *Work ability* (WA) was originally defined as a person's physical and mental ability to meet the demands of their job (Ilmarinen, 2009; Ilmarinen et al., 1991a). Its measurement was empirically (not theoretically) derived, but the construct has now been adopted by the organizational psychology literature (e.g., McGonagle, Fisher, Barnes-Farrell, & Grosch, 2015; Palermo, Fuller-Tyszkiewicz, Walker, & Appannah, 2013). Research has shown that WA is related to key employment outcomes such as retirement and future disability status (Feldt, Hyvönen, Mäkikangas, Kinnunen, & Kokko, 2009; Tuomi, Vanhala, Nykyri, & Janhonen, 2004). Moreover, WA has been linked to important job attitudes (e.g., organizational commitment; Feldt et al., 2009), job demands (e.g., physical demands; Alavinia, de Boer, van Duivenbooden, Frings-Dresen, & Burdorf, 2009), job resources (e.g., supervisor support; Sugimura & Thériault, 2010), and personal resources (e.g., self-efficacy, health, and coping; Palermo et al., 2013). Given the links between WA and these work-related factors, WA research is well-positioned to inform organizational practices and interventions that support individuals working effectively throughout their careers.

Although the concept of WA can influence research and practice on supporting employees across the life span, several questions remain regarding the WA construct. First, despite the WA literature being sufficiently mature, a quantitative synthesis of its nomological network has not been conducted (for qualitative reviews see Cadiz, Brady, Rineer, & Truxillo, 2018; van den Berg et al., 2008). Given the multidisciplinary nature of the WA construct, this is particularly important for bridging WA research across disciplines. Second, although WA varies across occupations, there has yet to be a systematic assessment of how occupation influences the relationships between WA and its correlates. Third, although WA is clearly useful as a predictive tool, only one study has investigated the convergent and divergent validity of WA (McGonagle et al., 2015), and none to our knowledge has investigated whether WA can explain unique variance in important job and health correlates compared with established constructs in the organizational sciences such as perceived fit, general self-efficacy, and job self-efficacy. Finally, the multidisciplinary history of WA has in many ways contributed to a rich, broad understanding of its impact on individuals and organizations; on the other hand, it has also resulted in a proliferation of WA measures that vary substantially in terms of the extent to which they include objective (e.g., diagnosed illnesses) or perceived (e.g., self-report) aspects of WA.¹ Although measuring a construct via different assessments is not necessarily a concern per se, the highly diverse content of different WA measures warrants further evaluation and is critical for interpreting WA research, identifying research gaps, and moving the WA literature forward.

In the present study, we address these issues by conducting a comprehensive, multidisciplinary (e.g., medicine, psychology), meta-analytic investigation of the WA literature. Using the job demands–resources (JD-R; Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) model as a framework, we set out to accomplish the following goals. First, we identify the theoretical antecedents and outcomes of WA across multiple disciplines and assess the strength of these relationships. Second, we evaluate the type of WA measure and occupation type as moderators between WA and its theoretical antecedents and

outcomes. In doing so, we shed light on how the content of the WA measure influences the relationships between WA and its theoretical antecedents and outcomes and we discuss the implications of those differences for the utility of the construct. Finally, we examine the relationship between perceived WA and related constructs (e.g., perceived fit, job self-efficacy) as well as the relative value of WA compared with related constructs in explaining work and health-related factors. Taken together, our goal is to further develop the theoretical underpinnings of the WA construct, the implications of measuring it in different ways and in different contexts, and the implications of WA research for workforce participation and workplace policies.

Development of the WA Construct

The WA construct was formally developed in the 1980s by Finnish researchers studying aging, work, and retirement (Ilmarinen et al., 1991b). In their study, they found that WA declined over an 11-year period, and that these declines were particularly prevalent among older employees and those working in blue-collar jobs (Ilmarinen, Tuomi, & Klockars, 1997). Interestingly, similar to research on other age-related differences (e.g., cognitive changes), WA trajectories varied substantially across individuals over the study period (Ilmarinen et al., 1997). These findings suggested that WA trajectories may be influenced by a number of contextual, workplace, and individual difference factors.

Although early research focused on how WA relates to health, retirement, and disability, Feldt and colleagues (2009) found that psychosocial workplace factors such as organizational climate and job control predicted WA trajectories over a 10-year period. Drawing on these findings, researchers began calling for additional work to investigate the impact of psychosocial workplace factors on WA (Feldt et al., 2009; Ilmarinen, 2009). Since then, researchers have begun to answer these calls (e.g., Airila et al., 2014; McGonagle et al., 2015). However, in doing so, the manner in which WA is measured has shifted in fundamental ways.

Measurement of Work Ability

As noted, the growth in WA research has coincided with a proliferation of WA measures that contain substantially different components of WA. Specifically, the following measures have been used to assess WA: the Work Ability Index (WAI; Ilmarinen et al., 1991a; Morschhäuser & Sochert, 2006); permutations of it that assess perceived WA, such as the Work Ability Score (Ahlstrom, Grimby-Ekman, Hagberg, & Dellve, 2010) and “perceived WA” (McGonagle et al., 2015); as well as holistic assessments of WA, such as the Work Ability-Personal Radar (WA-PR; Ilmarinen, Ilmarinen, Huuhtanen, Louhevaara, & Näsman, 2015) and Work Ability Survey – Revised (WAS-R; Noone, Mackey, & Bohle, 2014).

¹ When referring to the concept of work ability more broadly, we will use the abbreviation *WA*. When referring to perceived work ability specifically, we will use the term *perceived WA*. When referring to the Work Ability Index (WAI), which was the original measure of work ability and includes both objective and perceived components, we will use the abbreviation *WAI*.

Work Ability Index

The most commonly used measure of WA is the WAI, which has been translated into over 26 languages and is used worldwide (Ilmarinen et al., 1991a; Morschhäuser & Sochert, 2006). The WAI was formed with the goal of assessing “How good are workers at present and in the near future and how able are they to do their job with respect to work demands, health, and mental resources?” (Ilmarinen et al., 1997). As such, it incorporates several factors aimed at assessing both objective and subjective components of WA. Despite its widespread use, the WAI is problematic for at least four reasons. First, it combines objective health indicators (e.g., actual diagnosed diseases) and perceptual assessments of WA (e.g., self-ratings) into an overall WA score, despite evidence suggesting that a two-factor structure is more psychometrically sound (Martus, Jakob, Rose, Seibt, & Freude, 2010). Second, the WAI is long, containing 59 items including the health conditions checklist and taking 10–15 min to complete (Morschhäuser & Sochert, 2006). Third, the WAI includes sensitive health information (e.g., the health condition checklist) that respondents may feel uncomfortable sharing, particularly with their employer. Fourth, WA dimensions are scored using different response formats (e.g., 0–10 and 1–5) and weighting systems (e.g., multiplying dimension scores based on occupation), but the scores are then summed and converted into ordinal categories (i.e., quartiles), ranging from 7 to 49 (*poor* = 7–27, *moderate* = 28–36, *good* = 37–43, and *excellent* = 44–49). In terms of psychometric properties, this is problematic because it leads to a loss of information and decreased measurement variability.

Perceived WA Measures

To address the shortcomings of the WAI, researchers have adapted it in a number of ways, typically focusing on measures of perceived WA. One common adaptation is to use a single item from the WAI: “Describe your current work ability compared with your lifetime best,” which is termed the Work Ability Score (Ahlstrom et al., 2010). However, using this single item completely removes the objective health component of the WAI, and thus may not be sufficient for addressing WA. Further, using a single item likely increases measurement error due to the bias inherent in respondents’ self-assessments (Donaldson & Grant-Vallone, 2002).

Within the organizational psychology literature, researchers have used a variety of perceived WA measures, which are permutations of the WAI. For example, Weigl and colleagues (2013) assessed WA using the following two items from the WAI: “WA in relation to the physical demands of the job” and “WA in relation to the mental demands of the job” (Weigl et al., 2013). As another example, Palermo and colleagues (2013) assessed WA using a four-item measure that included two perceived WA items from the WAI plus two items in which respondents rated their expected WA five and 10 years in the future (Palermo et al., 2013). Finally, McGonagle and colleagues (2014, 2015) used a four-item perceived WA measure that includes the first three items from the WAI and a new item: “Current WA in relation to the social skill demands of one’s job” (McGonagle et al., 2014, 2015). These studies have begun to form the foundation of WA research within the organizational sciences.

Holistic Measures of Work Ability

Additional WA measures, such as the WA-Personal Radar (WA-PR; Ilmarinen et al., 2015) and WA Survey-Revised (WAS-R; Noone et al., 2014), are based on a more comprehensive approach to assessing WA, where contextual factors (e.g., social support, flexibility of working time) are included in the measure of WA. These measures, however, operationalize WA so broadly that they subsume theoretical antecedents of WA (e.g., work characteristics) within the WA measure. Thus, we argue that the overly broad content included in these measures leads to construct contamination.

Summary

WA has been operationalized in a number of ways, varying in terms of length, the inclusion of objective versus perceived components, and the breadth of content in the measure. Despite these differences, research has shown that WA is related to a host of important individual (e.g., health, quality of life; Ahlstrom et al., 2010) and organizational (e.g., job resources, job attitudes, retirement; McGonagle et al., 2015; Sell et al., 2009; Tuomi, Huuhtanen, Nykyri, & Ilmarinen, 2001) factors. However, although there are qualitative reviews of the WA concept (e.g., Cadiz et al., 2018; van den Berg, et al., 2008), there has not been a systematic empirical summary of this literature to elucidate its nomological network or investigate how the nomological network of WA is affected when using the WAI versus measures of perceived WA. This is a substantial problem given the large and accumulating body of research using both the WAI and perceived WA.

What Is Work Ability?

Taken together, our overview of WA measures poses the basic question. *What is work ability?* Clearly, researchers have measured WA in several ways, and this stems in part from the widely disparate disciplines in which the WA concept has evolved. Drawing on these different definitions, here we define WA simply as “an individual’s ability to continue working in their job,” which aligns with the definition of perceived work ability provided by McGonagle and colleagues (2015). Thus, when evaluating the antecedents of WA, it is important to consider both the occupational context (e.g., work demands) and personal characteristics (e.g., personal resources) of the individual. To best assess WA, one might consider both subjective (e.g., perceptual ratings) and objective (e.g., diagnosed health conditions) indicators of WA as is done with the WAI. However, assessing health conditions as an indicator of ability to work is questionable, unless those health conditions are tied to specific job requirements. For example, a leg injury would have a vastly different effect on a warehouse worker compared with a software engineer. Thus, we argue that perceptions of WA provide a sufficient assessment of WA and that perceptions of WA are important in their own right; this is consistent with the way in which the vast majority of constructs are evaluated within the organizational sciences (e.g., perceptions of job resources, job demands). With WA more succinctly defined, we turn to the job demands–resources model as a framework for examining the correlates of WA.

Toward a Conceptual Understanding of the Work Ability Construct: The Job Demands–Resources Model

Although early WA research was primarily atheoretical, researchers have recently begun applying the job demands–resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al., 2001) as a framework to build a theoretical understanding of WA (e.g., McGonagle et al., 2014, 2015). According to the JD-R model, *job demands* are characteristics of the job (e.g., workload) that require sustained effort or skill and result in physiological or psychological costs. In contrast, *job resources* (e.g., autonomy) are aspects of the job that aid in accomplishing work goals, reducing job demands, or encouraging personal growth (Demerouti et al., 2001). Although job demands are not necessarily detrimental, they can lead to increased strain and decreased motivation. In contrast, job resources can increase motivation, facilitate personal growth, and buffer against the negative effects of job demands (Bakker & Demerouti, 2007). Since its initial development, researchers have extended the JD-R model to include *personal resources* (e.g., health, optimism) that individuals can draw upon to meet the demands of their job (Demerouti & Bakker, 2011; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). In addition, the JD-R model includes health impairment and motivational pathways that serve as mediators between resources and demands and job outcomes (e.g., Bakker & Demerouti, 2007; Demerouti & Bakker, 2011).

Applying the JD-R Model to Work Ability

Because WA entails a person's ability to meet the demands of their job (Ilmarinen, 2009; Ilmarinen et al., 1991a), the JD-R model offers a useful framework for investigating the theoretical antecedents and outcomes of WA. We contend that WA can be incorporated into the JD-R model's health impairment and motivational pathways, where WA is influenced positively by job and personal resources and negatively by job demands (see Figure 1). As such, we view the antecedents of WA as existing in four broad categories within the JD-R framework: job demands, job resources, psychosocial personal resources, and health-based personal resources, and health-based per-

sonal resources. We also examined age as a fifth antecedent. Only some of these antecedents have been examined in past research on WA (e.g., McGonagle et al., 2015), and a comprehensive quantitative review of their relation to different WA measures has not been conducted. In addition, our study includes additional theoretical outcomes, such as job attitudes, job performance, work motivation, and strain, which have not been the primary focus on WA research in the past. Although we acknowledge the directionality of the relations between WA and certain correlates may be reciprocal (e.g., engagement; Airila et al., 2014), we use the JD-R framework to organize our hypotheses, and as such, discuss our hypotheses in terms of theoretical antecedents and outcomes.

Theoretical Antecedents of Work Ability

Job demands. We identified five job demand categories related to WA: quantitative, mental/emotional, physical, environmental, and workplace mistreatment. First, *quantitative job demands* such as time pressure and having a large quantity of tasks require high effort, drain the resources required to meet the demands of the job, and can lead to lower WA (McGonagle et al., 2015). Second, *mental/emotional demands* include ambiguity, direct conflict in one's defined role, and hiding one's emotions at work (Coverman, 1989; Eatough, Chang, Miloslavic, & Johnson, 2011). Third, *physical demands* require physical effort (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003), whereas the fourth category of *environmental conditions* includes working in taxing environments, such as those that are hot or noisy (Tuomi et al., 2004). Fifth, *workplace mistreatment* refers to any form of aggressive behavior or mistreatment (e.g., incivility, confrontations, bullying) by customers, coworkers, or supervisors. In line with the JD-R, we argue that these demands will be negatively related to WA because individuals need to draw on their available resources to accomplish work tasks when faced with these demands.

Hypothesis 1: Job demands will be negatively related to WA.

Job resources. We identified seven categories of job resources that may relate to WA: coworker support, supervisor

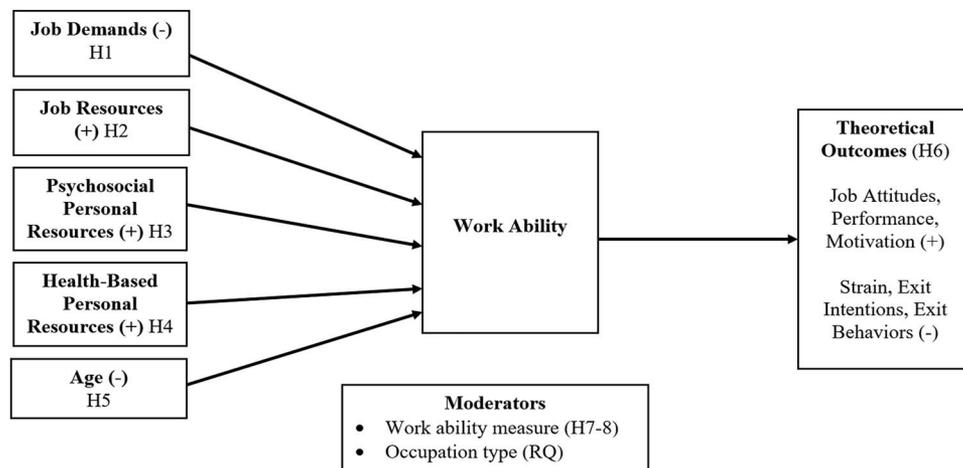


Figure 1. This model depicts the theoretical antecedents and outcomes of work ability.

support, job control, task resources, rewards, perceptions of justice, and organizational climate. *Coworker support* and *supervisor support* refer to perceived or actual assistance from others (Karasek, Triantis, & Chaudhry, 1982). *Job control* refers to decision-making freedom (Karasek, 1979) and may aid individuals in maintaining WA throughout the life span as functional capacities, interests, and knowledge change. *Task resources*, such as task variety and significance, can help build WA by facilitating skills acquisition and promoting a sense of accomplishment. Similarly, *rewards* such as promotion and adequate compensation as well as *perceptions of justice* should lead to increased WA. Finally, positive *organizational climate* may lead to greater WA by facilitating workers in meeting their work demands. In line with the JD-R, we predict that these job resources will be positively associated with WA.

Hypothesis 2: Job resources will be positively related to WA.

Psychosocial personal resources. Previous research has identified personal resources as perhaps the most strongly related resources to WA (McGonagle et al., 2015). Because of the extensive literature on health-based personal resources and WA, as well as the inclusion of health indicators in the WAI, we differentiate psychosocial personal resources and health-based personal resources in our study. *Psychosocial personal resources* are individual factors thought to aid workers in successfully fulfilling their work roles (Xanthopoulou et al., 2007). We identified 10 of these resources: core self-evaluations, job self-efficacy, conscientiousness, positive traits (e.g., optimism), cognitive functioning, social support (nonwork), coping, negative traits (e.g., hostility), grit/resilience, and selection, optimization, and compensation behaviors. This set of psychosocial personal resources expands upon previous work that has investigated a range of WA antecedents to include nonwork social support, SOC behaviors, and cognitive functioning. As an example, *core self-evaluations*, which are an individual's consistent appraisal of themselves and their abilities across situations (Judge & Bono, 2001), have been linked to greater WA (Palermo et al., 2013). In addition, although limited research has been conducted on WA and personality, some research has uncovered positive links between WA and personality indicators such as *conscientiousness* (e.g., McGonagle et al., 2015), and other *positive traits* (e.g., optimism; Mache, Danzer, Klapp, & Groneberg, 2013). Psychosocial personal resources can also take the form of behaviors aimed at adapting to one's changing abilities, such as *selection, optimization, and compensation (SOC) behaviors* (Baltes, 1997), as well as ability-based traits (e.g., *cognitive functioning*; Nygård, Eskelinen, Suvanto, Tuomi, & Ilmarinen, 1991). These resources can be drawn upon to meet the demands of the job, and thus, we argue that they will be positively related to WA.

Hypothesis 3: Psychosocial personal resources will be positively related to WA.

Health-based personal resources. Because of WA's roots in occupational medicine, *health-based personal resources* have been studied a great deal in relation to WA, and some health indicators are included in the WAI and have been commonly studied as antecedents to perceived WA (Abdolzadeh et al., 2012; Bethge, Radoschewski, & Gutenbrunner, 2012b; Morschhäuser & Sochert,

2006; von Bonsdorff, Huuhtanen, Tuomi, & Seitsamo, 2010). Note that, because of the content included in the WAI (e.g., health conditions checklist), there is the potential for spurious and inflated correlations when investigating the relations between health factors and WA, particularly when using the WAI. An individual's *health* is perhaps their most important personal resource, as it influences everyday functioning and their ability to perform job tasks. Indeed, indicators of general, physical, and mental health (e.g., self-ratings, BMI, pain symptoms) have been linked to WA (Airila, Hakonen, Punakallio, Lusa, & Luukkonen, 2012; Bethge et al., 2012b; El Fassi et al., 2013), such that indicators of better health are positively related to WA. In addition, health behaviors that positively impact one's personal resources, such as proper diet, physical activity, and refraining from smoking, are also likely related to WA. For example, refraining from smoking and excessive alcohol use and increased exercise are related to better health (Rimm, Klatsky, Grobbee, & Stampfer, 1996; Schane, Ling, & Glantz, 2010). Thus, we argue that these health-promoting behaviors should directly improve WA by increasing an individual's resource pool which can be drawn upon to meet the demands of their job.

Hypothesis 4: Health-based personal resources, including specific indicators of good health and positive health behaviors, will be positively related to WA.

Age. Because the aging workforce was the initial impetus for studying WA, and early research identified it as a key risk factor for poor WA (Ilmarinen et al., 1991a), we anticipate that chronological age will be negatively related to WA. Chronological age is generally associated with declines in physical abilities (Millanvoye, 1998) and certain cognitive abilities (e.g., fluid intelligence; Schaie & Willis, 1993). Further, age is also associated with greater risk for chronic health conditions (e.g., chronic back pain; Manchikanti et al., 2009), which are associated with lower levels of WA (El Fassi et al., 2013). Thus, we view age as a proxy for other developmental and experiential constructs (e.g., physical/cognitive abilities) and hypothesize that it will be negatively related to WA.

Hypothesis 5: Age will be negatively related to WA.

Theoretical Outcomes of Work Ability

According to the JD-R, job and personal resources lead to positive job outcomes via motivation, whereas job demands lead to negative outcomes via strain (e.g., burnout). We argue that WA influences work outcomes in a similar manner and serves as a link between job resources and job demands and job outcomes. Thus, in line with the JD-R, WA should relate to job outcomes including job attitudes, performance, strain, motivation, and withdrawal behaviors. First, we identified three *job attitudes*—job satisfaction (McGonagle et al., 2015), as well as organizational commitment, and the negative attitude of overcommitment—as being related to WA (e.g., Palermo et al., 2013). Second, although few studies have examined the WA–*job performance* relationship, we argue that if an individual has low WA, it is likely that their actual job performance will suffer as well. Third, according to the JD-R, *strain* (e.g., burnout, fatigue) results from an imbalance of demands and resources, where an individual experiences high demands and insufficient resources to meet those demands (Bakker & Demer-

outi, 2007). Thus, we expect lower levels of WA to relate to higher levels of strain including fatigue, perceived stress, and burnout. Fourth, the JD-R model posits that *motivation* is positively influenced by job resources (Demerouti et al., 2001), and we argue that WA operates in a similar manner, enabling individuals to allocate more resources to their work and that those with higher WA will report higher motivation (e.g., Airila et al., 2014; Emmerich & Rigotti, 2017; Hakanen, Bakker, & Schaufeli, 2006). Finally, because *exit from the workforce* (e.g., disability, retirement) was one of the key outcomes originally investigated with WA, and WA has been shown to negatively relate to these exit attitudes and behaviors (e.g., Ilmarinen et al., 1991b, 1997), we examined the relation between WA and exit intentions and behaviors.

Hypothesis 6: WA will be positively related to positive attitudinal, motivational, and behavioral job outcomes, and negatively related to strain and exit intentions and behaviors.

Moderators

As noted above, WA has been studied in variety of settings and measured in a number of different ways. Next, we investigate the extent to which relationships between WA and related constructs are dependent on two factors: occupation type and type of WA measure used.

Occupation type. Occupation type has been identified as a risk factor for low WA, such that those working in blue collar jobs (primarily physically demanding) have lower levels of WA compared with those in white collar jobs (primarily mentally demanding; Ilmarinen et al., 1997). Conceptually, the type of occupation an individual works in may also serve as a moderator of the relationships between WA and its correlates. Given our conceptualization of WA as an individual's ability to meet the demands of their job, the types of demands associated with a given job should play a critical role in an individual's WA. For example, although we anticipate that physical and mental health will be negatively related to WA, physical health may be more important in blue-collar jobs, and as such, the expected negative relationship between physical health and WA may be stronger. In contrast, for white-collar jobs, the relation between mental health and WA may be stronger. Although we expect occupation type to moderate the relationships between WA and its correlates, we believe the specific directions will vary depending on the specific correlate, and thus we pose this as a research question.

Research Question: Does occupation type moderate the relationships between WA and its antecedents and outcomes?

Measure type. At a conceptual level, we have discussed the need to distinguish between objective and perceived WA. Thus, we also empirically compare the nomological network of WA based on the most common types of WA measures: the WAI and perceived measures of WA. A small number of studies have descriptively compared how strongly the WAI is related to specific correlates relative to perceived WA, but these studies have been limited to specific samples and a small number of correlates, and have not empirically tested for the incremental validity of the WAI and perceived WA (e.g., Ahlstrom et al., 2010; El Fassi et al., 2013). To develop hypotheses regarding the constructs for which the WAI or perceived WA would be more strongly related, we turn

to the underlying theory behind them and the content of the measures.

Measures of perceived WA generally focus on one's ability to meet the demands of their job relative to their lifetime best, their current ability to meet specific types of job demands, and may also include perceptions about one's ability to meet those same demands at some point in the future (e.g., 2 years from now). In contrast, the WAI includes assessments of perceived WA, but was developed to incorporate a wide range of factors thought to underlie WA as well. As such, the WAI includes questions about current health conditions, absences from work, as well as mental resources such as depressive symptoms. Thus, when comparing the nomological network of the WAI compared with perceived WA, there is likely to be substantial overlap between the two constructs but also notable differences. Specifically, when investigating health-related correlates (e.g., subjective health, physical activity, disability status in the future), we anticipate that the WAI will demonstrate stronger associations with those health-related correlates than perceived WA. This is also attributable in part to the aforementioned construct contamination associated with the WAI. In contrast, perceived WA will be more strongly associated with job-focused correlates.

Hypothesis 7: The WAI will be more strongly related to health-based correlates than measures of perceived WA.

Hypothesis 8: Measures of perceived WA will be more strongly related to job-focused correlates than the WAI.

Distinguishing Work Ability From Related Constructs

Because the WA concept has only recently been integrated into the organizational psychology literature, it is also important to distinguish it from existing, related constructs, and determine if a measure of perceived WA adds any unique value when considering other established variables. Although WA may overlap conceptually with some established constructs, such as perceived fit, general self-efficacy, and job self-efficacy, McGonagle and colleagues (2015) provided initial support for WA as a unique construct, finding a moderate correlation between perceived WA and general self-efficacy ($r = .40$) as well as job self-efficacy ($r = .42$). Thus, to provide additional evidence of WA as a unique construct and demonstrate the relative value of perceived WA, we conducted a second study to evaluate the utility of perceived WA in explaining unique variance in important health and job-related correlates.

Perceived work ability compared with perceived fit. As discussed by Kristof-Brown, Zimmerman, and Johnson (2005), the concept of perceived fit assumes that the match or fit between one's ability and their job leads to positive outcomes (e.g., job satisfaction, commitment). Perceived fit typically entails a matching or ideal *fit* between the person and the environment, including one's desires, needs, preferences, knowledge, skills, and the job (Edwards, 1991). Although the match between ability and work environment is important and likely related to WA, there are several key distinctions. For example, an aspiring musician working as a cashier may rate their perceived fit with being a cashier as relatively poor; that is, their skills and interests do not fit well with the job they are doing. Indeed, the musician may despise their job and dream of the day they are able to quit, but continue working

there out of necessity. However, in the same scenario, the musician may have quite high perceptions of their WA—that is, their ability to meet the demands of their job. Thus, even though the fit between their job and their skills is poor, they are capable of meeting the demands of their job.

Perceived work ability compared with general self-efficacy. Following a review of the self-efficacy literature, Gist and Mitchell (1992) described self-efficacy as “beliefs in one’s capabilities to mobilize the motivation, cognitive resources, and courses of action to meet the given situational demands (Wood & Bandura, 1989).” Although perceived WA and general self-efficacy share a focus on perceptions of ability, self-efficacy is distinctly motivational, with an additional focus on taking action and allocating resources to accomplish goals. In contrast, WA is focused on meeting the basic demands of the job. Importantly, generalized self-efficacy is also considered to be consistent across contexts and can be considered an individual difference that people carry with them, similar to a personality trait. Within the JD-R, self-efficacy has been considered a personal resource that individuals can draw upon to meet job demands (Bakker & Demerouti, 2007; Xanthopoulou, Bakker, & Fischbach, 2013). These distinctions become clear when comparing items used to assess each construct. For example, consider this item from the Chen, Gully, and Eden (2001) general self-efficacy scale: “I will be able to achieve most of the goals that I have set for myself.” Now consider this item that is commonly used to assess perceived WA: “How do you rate your current work ability with respect to the mental demands of your work?” (Ilmarinen et al., 1997; McGonagle et al., 2015; Morschhäuser & Sochert, 2006). Clearly, both constructs and their respective measures assess self-perceptions, but they also differ substantially in the aforementioned ways. Although we anticipate generalized self-efficacy to be related to perceived WA, it is perhaps better considered an individual disposition, whereas perceived WA is far more context dependent.

Perceived work ability compared with job self-efficacy. To delineate between perceived WA and job self-efficacy, we point again to conceptual definitions as well as the measures for each construct. Measures of perceived WA generally focus on meeting basic demands. Further, measures of perceived WA often include an internal comparison to one’s lifetime best as well as an estimate of anticipated WA in the future. On the other hand, job self-efficacy measures typically focus on meeting goals and overcoming challenges. Thus, job self-efficacy may be best at teasing apart motivational differences separating top performers from average-level employees. However, we argue that both pieces of information can be quite useful for investigating important individual- and work-related research questions.

Summary. In the present study, we examine the empirical overlap among perceived WA, perceived fit, general self-efficacy, and job self-efficacy. Because of its roots in occupational medicine, components of internal comparison, and focus on meeting basic requirements of a job, we argue that measures of perceived WA will explain unique variance in health-related correlates (self-rated health, burnout, intentions to apply for disability) as well as performance-based correlates (engagement, task performance, organizational citizenship behaviors), even when accounting for perceived fit, general self-efficacy, and job self-efficacy. To further increase the precision of our hypotheses, we follow recommendations from Edwards and Berry (2010) and argue that be-

cause of the strong foundation of WA within the health context, perceived WA will explain the most predictive incremental utility in health-related correlates, a significant, but smaller in magnitude level of incremental predictive utility in performance-related correlates, and the least amount of incremental predictive utility in job attitude correlates.

Hypothesis 9: Perceived WA will explain incremental variance in health, exhaustion, and intentions to apply for disability over and above the related constructs of perceived fit, general self-efficacy, and job self-efficacy.

Hypothesis 10: Perceived WA will explain incremental variance in engagement and dimensions of performance over and above the related constructs of perceived fit, general self-efficacy, and job self-efficacy.

Hypothesis 11: Perceived WA will provide (a) the most incremental predictive utility in health-related outcomes, (b) the second most incremental predictive utility in performance-related outcomes, (c) the least incremental predictive utility in attitudinal outcomes (job satisfaction, affective commitment, and turnover intentions) over and above the related constructs of perceived fit, general self-efficacy, and job self-efficacy.

The Present Study

In the present study, we first conducted in-depth meta-analyses to evaluate Hypotheses 1–8 and our Research Question regarding differences in the correlates of WA based on occupation type. This allowed us to establish the multidisciplinary nomological network of WA, compare the nomological network of WA when using the WAI and measures of perceived WA, and evaluate occupation type as a moderator. To provide additional evidence of the value of perceived WA, we conducted a second study that assesses Hypotheses 9–11 regarding the unique variance explained by perceived WA, when simultaneously considering the related constructs, perceived fit, general self-efficacy, and job self-efficacy.

Study 1

Method

Literature search. Studies assessing WA and its correlates were collected via PsycINFO and PubMed. We searched PsycINFO because our primary focus was the use of the WA construct within the organizational psychology literature, but because of its roots in occupational medicine, we also searched the PubMed database. We used the search terms *work ability*, *workability*, and *work-ability*. The search results were limited to studies published after 1980 and prior to September, 2017, studies published in English, and included journal articles, dissertations, thesis projects, and book chapters. Following this initial search, we reviewed reference lists from studies included in our search and reviewed the Society for Industrial and Occupational Psychology and European Association of Work and Organizational Psychology conference programs from 2012–2017. Finally, we submitted a call for unpublished studies including WA via the Occupational Health Psychology and Organizational Behavior listservs. After cross-checking for duplicate articles, these searches yielded 1,715

unique studies, 786 from PsycINFO, 922 from Pubmed, and seven from other sources.

Screening and coding procedure. Screening and coding were conducted in three phases. During the screening process, each paper was screened for inclusion of a valid measure of WA and an effect size that could be converted into a correlation coefficient. Valid measures of WA were considered those that measured WA in line with the following conceptual definition of WA: An individual's ability to continue working in their job. Each article was also required to have enough information available to compute a correlation coefficient between WA and at least one other variable. During the screening phase, each article was reviewed by two members of the research team. Importantly, studies using only physician-diagnosed disability as a measure of WA rather than the WAI or perceived WA measures were not included in this study. Medical diagnoses are ratings of WA by a medical professional, not the individual, and generally are not considered within the scope of WA within the psychological literature.

Following the article screening, we identified $k = 247$ studies which included $n = 312,987$ individuals to analyze in our final dataset. During the first step of the coding process, each article was individually coded by two members of the research team, and disagreements between coders were resolved by a group discussion while reviewing the article in question. This coding was done at the highest level of specificity possible. For example, in the initial coding, the related constructs of self-esteem, self-efficacy, and other core self-evaluations (Judge & Bono, 2001) were coded into their narrowest construct category (e.g., self-esteem, self-efficacy). After the first phase of coding was complete, the second phase of the coding involved grouping constructs into broader categories (e.g., core self-evaluations) for the purpose of analysis based on the number of available studies and the conceptual similarity among the constructs (see the Appendix for coding descriptions of the included constructs). This final step of creating construct groupings was done with at least two members of the research team looking at each variable included to determine the appropriateness for combining them into an overarching category (see online supplemental materials for detailed study-level coding).

Moderator variables. Regarding the moderators, the following coding decisions were made. As a moderator, WA measure type was separated into studies that used the full WAI versus those that measured perceived WA exclusively. This distinction was used because the literature has largely utilized either the WAI or a measure of perceived WA. For the occupation type moderator variable, we were unable to use the O*Net classification of jobs since many samples included multiple specific jobs (e.g., bank employees, office workers). Rather, we coded occupation type as white-collar, which were considered to be primarily mentally demanding occupations (e.g., office, administrative), blue-collar, which were considered to be primarily physically demanding occupations (e.g., manual labor, front-line manufacturing), nurses/health care (e.g., nurses, nursing assistants, doctors), which were separated out due to the unique stressors associated with working in health care (i.e., mentally, physically, and emotionally challenging work), and studies that included mixed occupations (e.g., nationally representative samples) or other unique samples of employees (e.g., police personnel). The rationale for the distinction between these occupational groups is twofold. First, although there

are differences within each occupation type, theoretically, the driving factor differentiating blue collar occupations from other job types is the physical nature of these roles. Indeed, these occupations generally require different training (e.g., trade schools vs. traditional college education) and often involve comparable demands (e.g., standing, lifting, and working with hands or heavy machinery) even if the specific skillsets differ (e.g., factory line vs. construction worker). A similar argument can be made for white collar occupations being primarily mentally demanding, and health care being a notoriously high-demand industry, mentally, physically, and emotionally. Second, based in part on the distinction between three occupation types in the WAI—namely, (a) primarily mentally demanding, (b) primarily physically demanding, or (c) both mentally and physically demanding—researchers sometimes present results for each of these occupational groups (Ilmarinen et al., 1997) or describe their study population as consisting of jobs that fit within the white collar (e.g., technical administrative workers in education; Godinho et al., 2016) or blue collar dichotomy (e.g., manufacturing employees; Arandelović, Nikolić, & Stamenković, 2010).

Meta-analytic approach. The meta-analyses were conducted using the Hedges and Olkin (1985) approach using Comprehensive Meta-Analysis 3.0 (CMA; Borenstein, Hedges, Higgins, & Rothstein, 2014), wherein we converted all effect sizes into correlation coefficients. We selected the Hedges and Olkin approach for calculating weighted average correlations—as opposed to a psychometric approach (see Schmidt & Hunter, 2014)—because of limitations in the information provided by researchers publishing articles on WA and the ways in which correlates of WA were conceptualized or operationalized. Researchers using the WAI often categorize outcome scores based on the four WAI categories (*poor* = 2–27, *moderate* = 28–36, *good* = 37–43, and *excellent* = 44–49) and do not report estimates of reliability. Additionally, many of the antecedents and outcomes are observed variables with single-item indicators (e.g., age, BMI, smoking status, retirement and disability status). Thus, correction for attenuation due to unreliability in the predictor or outcome variable was either (a) not conceptually relevant or (b) not possible because of a lack of information provided in the empirical articles. The Hedges and Olkin approach thus provides a relatively conservative estimate of the effect sizes.

After converting all of the effect sizes to correlation coefficients, the meta-analyses were conducted in line with the proposed hypotheses. Consistent with prevailing meta-analytic practices, all analyses were conducted using random-effects models (Kepes, McDaniel, Brannick, & Banks, 2013). Consistent with recommendations by Borenstein, Hedges, Higgins, and Rothstein (2009), when studies included multiple measures of a broader construct, we used the arithmetic mean to generate a single effect size estimate based on each measure's correlations (Borenstein et al., 2009). Similarly, when a study assessed a given relation at multiple time points (e.g., WA and BMI at baseline and one year), the sample-weighted average correlation was computed based on the relationships across time and served as the effect size estimate.

In 13 of the included studies, we were able to code the relationships between WA and its correlates using both the WAI and a measure of perceived WA based on the same sample of participants. In these cases, the relationships between WA and its correlates were entered as independent effect sizes for each WA mea-

sure, despite the dependence between the estimates due to being based on the same sample. Although not ideal, Scammacca, Roberts, and Stuebing (2014) showed that there were minimal differences in the overall estimated effect sizes when these steps were taken. Thus, given that assessing the utility of these two approaches to measuring WA is a focal research question, we treated studies that reported effect size estimates for both the WAI and perceived WA as independent, even when they were derived from the same sample. The potential for publication bias was assessed via funnel plot diagrams and Begg and Mazumdar's (1994) rank correlation test for publication bias. These tests suggested only one instance of publication bias, which was for the relation between WA and future absenteeism; thus, some caution is warranted when interpreting that relation. However, we also note that this assessment included 58 tests for publication bias, only one of which suggested bias, and thus these estimates are likely largely free of publication bias.

Moderator analyses. To identify the existence of potential moderators for the hypothesized relations, the Q statistic (Rosenthal, 1991) and I^2 index (Higgins & Thompson, 2002; Huedo-Medina, Sánchez-Meca, Marín-Martínez, & Botella, 2006) were used as indicators of effect size heterogeneity that might be explained by moderators. The Q statistic indicates the variability in the underlying true effect sizes, with larger values indicating more heterogeneity (Huedo-Medina et al., 2006; Kepes et al., 2013) and significant values signaling heterogeneity in effect sizes beyond sampling error and the presence of moderators. The I^2 index indicates the magnitude of the variability among effect sizes, and can be interpreted as the percentage of observed variability that can be attributed to true variability, with values closer to 100% being consistent with the presence of moderators (Huedo-Medina et al., 2006; Kepes et al., 2013). Although these tests serve as indicators of the potential presence of moderators, the moderator analyses were conducted in each case where there was a sufficient number of studies. This is supported by findings from Hedges and Pigott (2001), suggesting the power to detect heterogeneity among effect size estimates can be low in meta-analyses, particularly when k is relatively small.

The Q statistic was also used to assess whether effect sizes showed significant variability across levels of categorical moderator variables. For the WA measure type moderator, studies were coded as using either the WAI or a perceived WA measure. Accordingly, a significant Q statistic signals statistical differences in effect sizes between studies using the WAI measure versus a perceived WA measure. Of note, the occupation type moderator was coded into four categories: white-collar, blue-collar, nursing/health care, and mixed or other occupations. Given that the purpose of assessing occupation as a moderator is to determine for which occupation types a given factor is more strongly related to WA, we excluded the mixed occupation group from these analyses. Occupation type as a moderator was evaluated using the Q statistic via pairwise tests between the white-collar, blue-collar, and nursing/health care occupation types.

Results

Meta-analyses were used to assess Hypotheses 1–8 and our Research Question. Results of the overall estimates are presented for the correlates of WA in terms of the theoretical antecedents and

outcomes in Tables 1 and 2, respectively, as well as in Figure 2. Moderator analyses, separated by the theoretical antecedents and outcomes, are presented for the type of WA (see Tables 3 and 4) and occupation type (see Tables 5 and 6). We discuss the results of the moderator analyses, evaluating Hypotheses 7 and 8 and our Research Question, within the results for each main effect. We then provide a brief summary for each at the end of the results section. For details regarding the categorization of the correlates of WA, see the Appendix. For parsimony, we note here that in each of the overall estimates aside from two associations—objective health indicators and alcohol consumption—the 95% confidence interval did not include zero. In addition, the Q statistic and I^2 index indicated the presence of potential moderators for most associations, with the exceptions of cognitive ability, coping, and grit/resilience. In the following sections, we highlight findings from each hypothesis and research question.

Theoretical antecedents of WA.

Job demands. In support of Hypothesis 1, associations between job demands and WA were consistently negative ($\bar{r} = -.205$, $k = 55$). Between the five job demand categories (i.e., *quantitative demands*, *mental/emotional demands*, *physical demands*, *environmental conditions*, *workplace mistreatment*), however, estimates did vary to some extent, with the weakest association for environmental conditions (e.g., hot and humid workplaces; $\bar{r} = -.110$, $k = 10$) and the strongest the association for mental/emotional demands (e.g., role conflict, and hiding emotions; $\bar{r} = -.270$, $k = 12$). Although the Q statistic and I^2 index indicated the presence of moderators, WA measure type and occupation type did not explain significant variation in the relations between job demands and WA.

Job resources. Providing strong support for Hypothesis 2, job resources were consistently and positively related to WA ($\bar{r} = .212$, $k = 62$). Across the seven job resource categories (i.e., *coworker support*, *supervisor support*, *job control*, *task resources*, *rewards*, *justice perceptions*, *positive organizational climates*), associations ranged from ($\bar{r} = .197$, $k = 11$) for organizational climate to ($\bar{r} = .272$, $k = 15$) for justice perceptions. Moderator analyses showed that the relation between job resources and WA was stronger in studies using the WAI ($\bar{r} = .245$, $k = 26$) than in those using perceived WA measures ($\bar{r} = .188$, $k = 39$; $Q = 3.90$, $p = .049$). Additionally, with regard to occupation type, job resources were more strongly related to WA for those working in white-collar occupations ($\bar{r} = .273$, $k = 13$) than blue-collar occupations ($\bar{r} = .172$, $k = 10$; $Q = 7.72$, $p = .005$) and to a marginal extent, nursing/health care occupations ($\bar{r} = .210$, $k = 13$; $Q = 2.93$, $p = .087$). Drilling down to specific job resources, this effect was only present for job control ($Q = 13.24$, $p < .001$), which was more strongly associated with WA in white-collar occupations ($\bar{r} = .298$, $k = 10$) than in blue-collar occupations ($\bar{r} = .140$, $k = 7$). Similarly, the relation between job control and WA was stronger for those in white-collar occupations compared with those in nursing/health care occupations ($\bar{r} = .200$, $k = 6$; $Q = 5.56$, $p = .018$).

Psychosocial personal resources. In support of Hypothesis 3, psychosocial personal resources were positively related to WA ($\bar{r} = .253$, $k = 39$). Across the 10 psychosocial personal resources (i.e., *core self-evaluations*, *job self-efficacy*, *conscientiousness*, *cognitive functioning*, *positive traits*, *grit/resilience*, *negative traits*, *social support (nonwork)*, *coping*, and

Table 1
Random-Effects Meta-Analytic Estimates of the Relationships Between Work Ability and Its Theoretical Antecedents

Theoretical antecedent	<i>k</i>	<i>N</i>	\bar{r}	95% CI \bar{r}		<i>Q</i>	<i>I</i> ²
				LL	UL		
Job demands	55	52,136	-.205	-.247	-.163	1496.71**	96.39
Quantitative demands	28	29,624	-.200	-.246	-.154	317.34**	91.49
Mental/Emotional demands	12	6,402	-.270	-.372	-.162	209.31**	94.75
Physical demands	30	28,845	-.199	-.236	-.161	294.64**	90.16
Environmental conditions	10	7,620	-.110	-.160	-.049	67.31**	86.63
Workplace mistreatment	14	7,909	-.188	-.282	-.090	225.02**	94.22
Job resources	62	75,168	.212	.185	.239	841.06**	92.75
Coworker support	15	9,595	.258	.210	.304	62.31**	77.53
Supervisor support	25	17,830	.225	.185	.265	169.52**	85.84
Job control	40	46,614	.218	.186	.249	443.52**	91.21
Task resources	13	14,756	.223	.163	.281	143.05**	91.61
Rewards	6	15,047	.228	.131	.321	151.38**	96.70
Justice perceptions	15	12,405	.272	.191	.350	271.36**	94.84
Org. climate	11	5,665	.197	.152	.241	26.20**	61.84
Psychosocial personal resources	39	31,174	.253	.206	.299	1053.94**	96.39
Core self-evaluations	11	5,032	.377	.294	.455	84.38**	88.15
Job self-efficacy	6	1,666	.352	.284	.417	8.17	38.80
Conscientiousness	4	2,193	.341	.234	.440	11.46**	73.82
Positive traits (e.g., optimism)	4	2,204	.282	.167	.389	12.07**	75.14
Cognitive ability	4	528	.234	.111	.350	6.36†	52.82
Coping	3	9,248	.113	.038	.186	3.87	48.34
Negative traits (e.g., hostility)	7	3,078	-.295	-.362	-.225	18.70**	67.91
Grit/Resilience	3	638	.371	.302	.436	.21	.00
SOC behaviors	7	8,713	.151	.082	.219	28.30**	78.80
Social support (nonwork)	8	5,176	.204	.073	.328	288.96**	97.58
Health-based personal resources							
General health	87	113,439	.383	.343	.421	4136.67**	97.92
Symptoms (nonpain)	12	15,508	-.389	-.470	-.301	306.42**	96.41
Current health status	32	56,775	.335	.276	.391	1279.07**	97.58
Previous absenteeism ^a	15	24,594	-.238	-.295	-.180	158.49**	91.17
Sleep	11	13,348	.282	.220	.342	74.70**	86.61
Mental health	43	68,684	.434	.388	.477	1,567.55**	97.32
Anxiety	6	4,119	-.380	-.452	-.302	16.31*	69.34
Depressive symptoms	14	19,338	-.460	-.542	-.370	563.89**	97.70
Physical health	84	82,421	.311	.266	.354	3074.86**	97.30
Physical Ability	18	1,710	.240	.123	.350	83.00**	79.52
BMI	31	37,264	-.125	.097	.153	122.10**	75.43
Objective health indicators	5	945	.139	-.035	.305	26.23**	84.75
Symptoms (pain-related)	38	29,133	.357	.316	.397	556.09**	93.35
Health behaviors	41	50,574	.072	.049	.094	149.06**	73.17
Physical activity	29	15,318	.113	.076	.150	133.01**	78.95
Smoking (tobacco)	31	44,828	-.080	-.104	-.056	101.79**	70.53
Alcohol consumption	20	28,478	-.007	-.052	.037	194.82**	90.25
Age	111	108,259	-.114	-.135	-.093	2508.29**	95.62

Note. LL = lower level; UL = upper level. All analyses were conducted using random-effects models to compute the weighted average correlation (\bar{r}). In analyses where an overall estimate includes sub-analyses in the opposite direction, the effects in the opposite direction (e.g., anxiety) are recoded to represent that broader category in a positive manner (e.g., positive mental health).

^a Previous sick leave is item 5 in the WAI; however, studies included in this analysis used WA measures that were either perceived WA measures, or omitted item 5 from their WA measure.

† $p < .10$. * $p < .05$. ** $p < .01$.

selection, optimization, and compensation [SOC] behaviors), core-self evaluations ($\bar{r} = .377$, $k = 11$) and grit/resilience ($\bar{r} = .371$, $k = 3$) were most strongly related to WA, whereas coping ($\bar{r} = .113$, $k = 3$) and SOC behaviors were least strongly associated with WA ($\bar{r} = .151$, $k = 7$). The association between overall psychosocial personal resources and WA did not differ by WA measure type. However, negative traits were less strongly related to WA in studies using the WAI ($\bar{r} = -.199$, $k = 3$) compared with those using perceived WA measures ($\bar{r} = -.346$, $k = 4$; $Q = 4.19$, $p = .041$). The relation between

psychosocial personal resources and WA was not moderated by occupation.

Health-based personal resources. We identified three broad categories of health-based personal resources in addition to health behaviors which all positively related to WA and thus, provide strong support for Hypothesis 4: *general health* ($\bar{r} = .383$, $k = 87$), *mental health* ($\bar{r} = .434$, $k = 43$), *physical health* ($\bar{r} = .311$, $k = 84$), and *health behaviors* ($\bar{r} = .072$, $k = 41$). Within these categories, we identified 10 specific health indicators: *nonpain symptoms* (e.g., dizziness, difficulty concentrating, and stomach

Table 2
Random-Effects Meta-Analytic Estimates of the Relationships Between Work Ability and Its Theoretical Outcomes

Theoretical outcome	k	N	\bar{r}	95% CI \bar{r}		Q	I ²
				LL	UL		
Job attitudes	19	19,842	.262	.213	.309	182.40**	90.13
Job satisfaction	10	11,781	.283	.235	.330	37.21**	75.81
Org. commitment	6	7,084	.256	.152	.353	80.12**	93.76
Overcommitment	4	1,280	-.218	-.340	-.088	14.77**	79.69
Job performance (self-rated)	9	24,524	.324	.239	.404	434.12**	98.16
Work motivation	16	18,241	.304	.225	.379	397.24**	96.22
Strain	39	23,909	-.396	-.456	-.333	1480.30**	94.43
Fatigue	17	9,211	-.416	-.482	-.344	212.05**	92.46
Burnout	14	9,783	-.444	-.505	-.378	172.76**	92.48
Perceived stress	13	7,691	-.347	-.452	-.231	471.64**	97.46
Exit intentions	21	35,235	-.263	-.349	-.173	580.10**	96.52
Retirement intentions	9	9,060	-.241	-.388	-.083	482.12**	98.34
Turnover intentions	13	26,478	-.273	-.354	-.188	96.87**	87.61
Exit behaviors	20	44,811	-.257	-.324	-.189	1639.07**	98.84
Future absenteeism	13	30,505	-.225	-.305	-.142	1448.57**	99.17
Future disability status	6	4,967	-.384	-.512	-.239	150.21**	96.67
Retirement	4	5,598	-.189	-.268	-.106	15.47**	80.61

Note. LL = lower level; UL = upper level. All analyses were conducted using random-effects models to compute the weighted average correlation (\bar{r}). The Q statistic indicates heterogeneity among the effect size estimates, suggesting that there are moderators to the point estimate when it is significant. ** p < .01.

problems), *current health status* (e.g., being free from negative health conditions), *previous absenteeism, sleep, depressive symptoms, anxiety, physical ability, BMI, objective indicators* (e.g., cholesterol), and *pain-related symptoms* as well as the three specific health behaviors *physical activity, smoking* (tobacco), and *alcohol consumption*. Note that health indicators reflecting poor health, such as depressive symptoms, were recoded as positive when assessing the overall category of mental health and coded as negative when reporting on the specific indicator (e.g., anxiety). Among these, depressive symptoms was most strongly related to WA ($\bar{r} = -.460, k = 14$), whereas the weakest relations were with BMI ($\bar{r} = -.125, k = 31$), physical activity ($\bar{r} = .113, k = 29$),

and smoking ($\bar{r} = -.080, k = 31$). Objective indicators of physical health (e.g., cholesterol, blood pressure) and alcohol consumption were not related to WA ($\bar{r} = .139, k = 5, 95\% \text{ CI } [-.035, .305]$ and $\bar{r} = -.007, 95\% \text{ CI } [-.052, .037], k = 20$, respectively).

The WA measure type moderated the association between general health and WA, such that the effect was stronger in studies where the WAI was used ($\bar{r} = .433, k = 39$) than in those that used a perceived WA measure ($\bar{r} = .347, k = 52; Q = 4.77, p = .029$). In addition, when using the WAI, the relation between current health status and WA was stronger ($\bar{r} = .476, k = 10$) than when using a perceived WA measure ($\bar{r} = .290, k = 25; Q = 11.14, p = .001$). Given that diagnosed illnesses are subsumed in the WAI,

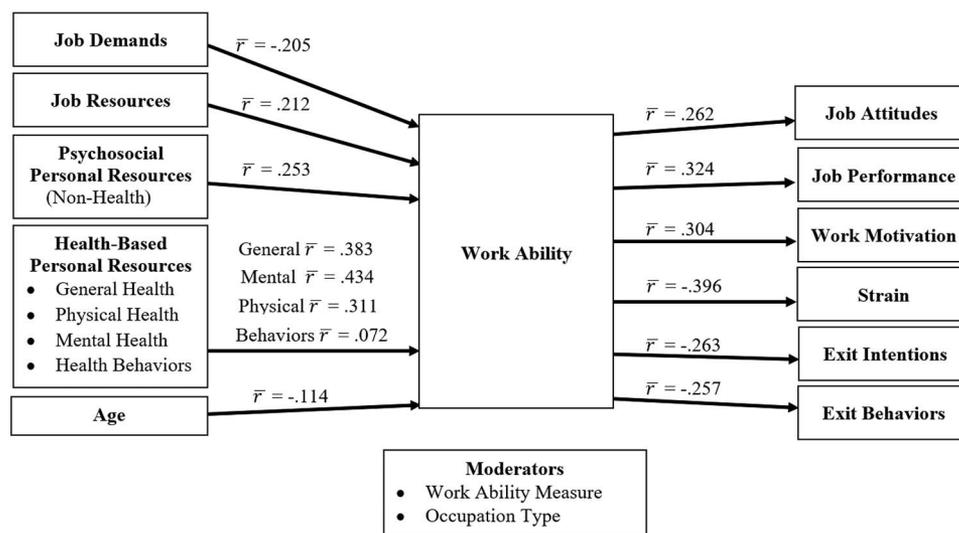


Figure 2. Meta-analytic results reporting the relationships between work ability and Its theoretical antecedents and outcomes.

Table 3
 Mixed-Effects Meta-Analytic Estimates of the Relationships Between WA and Its Antecedents (by WA Measure)

Theoretical antecedent	WA measure	<i>k</i>	<i>N</i>	\bar{r}	95% CI \bar{r}		<i>Q</i>
					LL	UL	
Job demands	WAI	27	12,013	-.207	-.268	-.145	.01
	PWA	29	40,526	-.204	-.265	-.144	
Quantitative demands	WAI	11	3,300	-.215	-.291	-.136	.21
	PWA	17	26,320	-.192	-.251	-.133	
Mental/Emotional demands	WAI	4	830	-.223	-.345	-.094	1.75
	PWA	8	5,572	-.368	-.524	-.188	
Physical demands	WAI	13	7,286	-.163	-.225	-.101	1.97
	PWA	18	21,957	-.222	-.274	-.168	
Environmental conditions	WAI	4	2,098	-.111	-.195	-.025	.00
	PWA	6	5,522	-.109	-.175	-.043	
Workplace mistreatment	WAI	5	2,121	-.284	-.451	-.099	3.10 [†]
	PWA	9	5,788	-.134	-.226	-.039	
Job resources	WAI	26	25,094	.245	.201	.288	3.90*
	PWA	39	52,541	.188	.150	.224	
Coworker support	WAI	4	1,053	.332	.235	.422	2.98 [†]
	PWA	11	8,542	.235	.181	.288	
Supervisor support	WAI	6	3,986	.291	.215	.363	3.62 [†]
	PWA	21	15,404	.207	.163	.249	
Job control	WAI	14	8,159	.232	.173	.289	.66
	PWA	27	39,363	.202	.159	.245	
Task resources	WAI	6	6,906	.209	.136	.280	.39
	PWA	8	8,253	.239	.177	.299	
Justice perceptions	WAI	10	5,654	.316	.212	.413	2.04
	PWA	5	6,751	.186	.033	.330	
Org. climate	WAI	3	1,566	.237	.153	.317	1.33
	PWA	8	4,099	.180	.128	.231	
Psychosocial personal resources	WAI	17	7,967	.217	.142	.288	1.43
	PWA	24	24,330	.275	.213	.334	
Core self-evaluations	WAI	4	768	.367	.220	.498	.06
	PWA	8	4,480	.388	.291	.477	
Negative traits (e.g., hostility)	WAI	3	552	-.199	-.314	-.079	4.19*
	PWA	4	2,526	-.346	-.423	-.264	
Health-based personal resources	WAI	39	42,741	.433	.375	.487	4.77*
	PWA	52	84,455	.347	.294	.398	
Symptoms (nonpain)	WAI	5	5,203	-.417	-.538	-.280	.37
	PWA	7	10,305	-.365	-.478	-.239	
Current health status	WAI	10	17,391	.476	.387	.556	11.14**
	PWA	25	52,738	.290	.227	.350	
Sleep	WAI	9	13,276	.279	.215	.342	.79
	PWA	3	475	.352	.201	.487	
Physical health	WAI	57	42,441	.333	.280	.384	2.52
	PWA	31	54,186	.262	.188	.332	
Physical ability	WAI	15	1,538	.253	.128	.371	.32
	PWA	4	253	.176	-.072	.403	
BMI	WAI	21	26,714	.137	.102	.172	1.55
	PWA	12	23,792	.102	.059	.144	
Symptoms (pain-related)	WAI	20	21,222	.385	.333	.434	2.59
	PWA	20	36,885	.326	.273	.376	
Mental health	WAI	27	28,420	.452	.398	.502	1.43
	PWA	17	53,119	.399	.328	.466	
Depressive symptoms	WAI	6	4,738	-.467	-.596	-.315	.02
	PWA	8	14,615	-.455	-.568	-.326	
Health behaviors	WAI	29	31,239	.074	.046	.103	.02
	PWA	16	32,775	.078	.041	.114	
Physical activity	WAI	20	8,615	.110	.065	.156	.55
	PWA	12	7,304	.138	.081	.194	
Smoking (tobacco)	WAI	23	28,906	-.074	-.103	-.045	.37
	PWA	10	29,164	-.090	-.132	-.048	
Alcohol consumption	WAI	13	11,996	-.017	-.075	.042	.10
	PWA	8	16,885	-.002	-.072	.068	
Age	WAI	71	65,763	-.129	-.155	-.103	2.13
	PWA	45	58,731	-.099	-.130	-.067	

Note. WA = work ability; WAI = Work Ability Index; PWA = perceived work ability; LL = lower level; UL = upper level. All analyses were conducted using mixed-effects models to compute the weighted average correlation (\bar{r}). *Q* represents the significance test for heterogeneity in the effect size estimates between the two subgroups (the full WAI compared with perceived WA). *k* within these analyses may exceed the *k* for the overall estimate because we separated studies that measured WA using the WAI and a measure of perceived WA into independent effects for these analyses.

[†] *p* < .10. * *p* < .05. ** *p* < .01.

Table 4
Mixed-Effects Meta-Analytic Estimates of the Relationships Between WA and Its Outcomes (by WA Measure)

Theoretical outcome	WA measure	k	N	\bar{r}	95% CI \bar{r}		Q
					LL	UL	
Job attitudes	WAI	12	10,414	.235	.180	.288	2.46
	PWA	8	9,379	.299	.239	.356	
Job satisfaction	WAI	6	8,410	.268	.205	.32	.00
	PWA	5	3,587	.271	.205	.334	
Strain	WAI	21	10,062	-.414	-.497	-.324	.69
	PWA	19	14,754	-.358	-.453	-.254	
Fatigue	WAI	12	4,877	-.441	-.520	-.355	1.27
	PWA	5	4,334	-.345	-.485	-.187	
Burnout	WAI	5	3,678	-.464	-.553	-.364	.24
	PWA	9	6,105	-.431	-.510	-.345	
Perceived stress	WAI	6	3,202	-.347	-.503	-.169	.11
	PWA	8	5,396	-.308	-.451	-.149	
Work motivation	WAI	8	10,536	.316	.207	.417	.022
	PWA	9	8,109	.305	.203	.401	
Exit intentions	WAI	15	27,769	-.313	-.406	-.213	3.35 [†]
	PWA	6	7,466	-.139	-.296	.026	
Exit Behaviors	WAI	15	36,810	-.280	-.360	-.196	.00
	PWA	7	10,504	-.284	-.398	-.161	
Future disability status	WAI	4	3,349	-.534	-.657	-.384	5.56*
	PWA	3	2,263	-.236	-.450	-.016	
Future absenteeism	WAI	9	24,065	-.197	-.286	-.104	1.35
	PWA	5	8,226	-.285	-.398	-.164	

Note. WA = work ability; WAI = Work Ability Index; PWA = perceived work ability; LL = lower level; UL = upper level. All analyses were conducted using mixed-effects models to compute the weighted average correlation (\bar{r}). Q represents the significance test for heterogeneity in the effect size estimates between the two subgroups (the full WAI compared with perceived WA). k within these analyses may exceed the k for the overall estimate because we separated studies that measured WA using the WAI and a measure of perceived WA into independent effects for these analyses.

[†] p < .10. * p < .05.

this discrepancy is not surprising, but it is important to note that perceived WA measures still demonstrated a moderate negative association with health status.

Occupation type also moderated several relations. Mental health was more strongly related to WA for those working in white-collar occupations ($\bar{r} = .529, k = 9$) than for those working in blue-collar occupations ($\bar{r} = .400, k = 6; Q = 7.99, p = .005$) and nursing/health care occupations ($\bar{r} = .396, k = 5; Q = 7.14, p = .008$). Similarly, occupation type moderated the relation between physical health and WA, and interestingly, the relation between physical health and WA was stronger in primarily white-collar occupations ($\bar{r} = .512, k = 9$) than in blue-collar occupations ($\bar{r} = .262, k = 20; Q = 6.33, p = .012$). Occupation type also moderated the relation between health behaviors and WA when comparing blue collar occupations ($\bar{r} = .109, k = 13$) to nursing/health care occupations ($\bar{r} = -.011, k = 4; Q = 5.98, p = .014$). Further, physical activity was more strongly related to WA among those in blue-collar occupations ($\bar{r} = .154, k = 8$) than those in nursing/health care jobs ($\bar{r} = -.008, k = 3; Q = 5.21, p = .022$), whereas there was a marginally significant difference between those in white-collar occupations ($\bar{r} = .160, k = 3$) and nursing/health care occupations ($Q = 3.14, p = .077$). Finally, smoking was more strongly and negatively related to WA among workers in blue-collar occupations ($\bar{r} = -.108, k = 9$) than those in nursing/health care occupations ($\bar{r} = -.022, k = 3; Q = 5.72, p = .017$).

Age. Overall, age was negatively related to WA ($\bar{r} = -.114, k = 111$). However, the relationship between age and WA was not moderated by the WA measure type or occupation type. Although

the effect of age was small, its relationship with WA was robust and consistent across contexts, providing support for Hypothesis 5.

Theoretical outcomes of WA. In line with the JD-R model, we hypothesized that WA is associated with work-related outcomes as well. For clarity, we present these findings according to the following categories: *job attitudes, job performance, motivation, strain, and exit intentions and behaviors*. As described in the following sections, we found general support for Hypothesis 6, as WA was associated with the aforementioned outcomes in the expected directions.

Job attitudes. Overall, WA was moderately and positively related to job attitudes ($\bar{r} = .262, k = 19$). Specifically, the job attitudes of *job satisfaction* ($\bar{r} = .283, k = 10$), *organizational commitment* ($\bar{r} = .256, k = 6$), and *overcommitment* ($\bar{r} = -.218, k = 4$) showed similarly sized relations with WA. Note that overcommitment is a negative attitude representing unhealthy commitment to one's work and was thus reverse coded when computing the overall effect of WA on job attitudes. The association between job attitudes and WA was not moderated by WA measure type or occupation type.

Job performance. WA was positively related to job performance ($\bar{r} = .324, k = 9$). Although this positive relation between WA and performance is potentially meaningful, it is important to note that these estimates consisted of self-report ratings of job performance. Although the Q statistic and I² index suggest the potential for moderators, there was an insufficient number of samples to assess WA measure type and occupation type as moderators.

Table 5
Mixed-Effects Meta-Analytic Estimates of the Relationships Between WA and Its Antecedents and Outcomes (by Occupation)

Theoretical antecedent	<i>k</i>	<i>N</i>	\bar{r}	95% CI \bar{r}		White vs. Blue collar <i>Q</i>	White collar vs. Nursing <i>Q</i>	Blue collar vs. Nursing <i>Q</i>
				LL	UL			
Job demands						1.95	.14	1.30
White collar	8	10,990	-.277	-.384	-.164			
Blue collar	8	3,359	-.161	-.278	-.039			
Nursing/Healthcare	9	3,883	-.244	-.363	-.118			
Physical job demands						.27	.34	.00
White collar	4	3,741	-.215	-.323	-.100			
Blue collar	4	1,645	-.179	-.295	-.057			
Nursing/Healthcare	4	1,782	-.189	-.315	-.056			
Quantitative job demands								.01
Blue collar	4	1,411	-.200	-.322	-.071			
Nursing/Healthcare	6	2,411	-.193	-.252	-.134			
Workplace mistreatment							.52	
White collar	4	2,506	-.215	-.292	-.136			
Nursing/Healthcare	3	1,697	-.310	-.555	-.016			
Job resources						7.72**	2.93 [†]	.50
White collar	13	15,037	.273	.220	.324			
Blue collar	10	3,004	.172	.099	.244			
Nursing/Healthcare	13	13,403	.210	.151	.269			
Job control						13.24**	5.56*	.99
White collar	10	13,141	.298	.252	.342			
Blue collar	7	2,442	.140	.069	.210			
Nursing/Healthcare	6	1,421	.200	.122	.277			
Justice perceptions								.10
Blue collar	4	1,085	.235	.079	.381			
Nursing/Healthcare	5	3,888	.203	.073	.326			
Org. climate								
White collar	3	2,856	.203	.151	.254			
Nursing/Healthcare	3	260	.228	.102	.348			
Psychosocial personal resources						1.38	.01	.52
White collar	7	3,527	.243	.140	.341			
Blue collar	4	1,436	.165	.020	.303			
Nursing/Healthcare	8	3,116	.238	.136	.336			
General health						2.87 [†]	.03	3.37 [†]
White collar	12	15,395	.447	.351	.533			
Blue collar	14	9,456	.349	.251	.439			
Nursing/Healthcare	12	14,692	.457	.359	.545			
Current health status						1.15	.00	.44
White collar	3	1,484	.422	.241	.575			
Blue collar	3	1,905	.362	.171	.526			
Nursing/Healthcare	3	1,134	.425	.232	.587			
Mental health						7.99**	7.14**	.85
White collar	9	12,733	.529	.462	.590			
Blue collar	6	1,687	.400	.296	.494			
Nursing/Healthcare	5	3,241	.396	.282	.500			
Physical health						6.33*	2.33	.87
White collar	9	5,660	.512	.413	.599			
Blue collar	20	7,354	.262	.175	.345			
Nursing/Healthcare	12	6,850	.330	.227	.427			
BMI						.64	3.62 [†]	.04
White collar	3	1,345	.161	.071	.249			
Blue collar	12	4,718	.115	.065	.164			
Nursing/Healthcare	3	1,716	.100	.011	.188			
Symptoms (pain-related)						.03	2.88 [†]	2.26
White collar	5	2,910	.456	.375	.530			
Blue collar	6	2,469	.455	.372	.530			
Nursing/Healthcare	7	2,388	.351	.266	.430			
Health Behaviors						.86	1.57	5.98*
White collar	4	3,171	.065	.000	.129			
Blue collar	13	6,108	.109	.065	.152			
Nursing/Healthcare	4	2,105	-.011	-.080	.057			
Physical Activity						.01	3.14 [†]	5.21*
White collar	3	1,739	.160	.061	.256			
Blue collar	8	5,030	.154	.090	.217			

Table 5 (continued)

Theoretical antecedent	k	N	\bar{r}	95% CI \bar{r}		White vs. Blue collar Q	White collar vs. Nursing Q	Blue collar vs. Nursing Q
				LL	UL			
Nursing/Healthcare	3	1,651	-.008	-.108	.092			
Smoking						.00	.89	5.72*
White collar	3	1,476	-.089	-.167	-.010			
Blue collar	9	4,142	-.108	-.155	-.060			
Nursing/Healthcare	3	1,607	-.022	-.097	.053			
Drinking						.04		
White collar	3	1,766	.016	-.102	.134			
Blue collar	5	2,406	-.023	-.128	.083			
Age						.14	.03	.25
White collar	12	12,378	-.132	-.204	-.058			
Blue collar	29	19,071	-.114	-.163	-.065			
Nursing/Healthcare	20	14,394	-.134	-.190	-.077			

Note. WA = work ability; LL = lower level; UL = upper level. Only comparisons where at least two occupation groups had three or more effect size estimates were assessed. Where the Q values are presented, Q indicates the heterogeneity of the effect size estimates between two occupational groups. For example, the first column reporting a Q value indicates the difference in effect size estimates between studies using white collar versus blue collar occupation types.

† p < .10. * p < .05. ** p < .01.

Motivation. WA was positively related to *motivation*, ($\bar{r} = .304, k = 16$). This relation was not moderated by WA measure type or occupation type.

Strain. Strain was assessed as measures of *fatigue*, *burnout*, and *perceived stress*, and was consistently and negatively related to WA ($\bar{r} = -.396, k = 39$). Specifically, fatigue ($\bar{r} = -.416, k = 17$) and burnout ($\bar{r} = -.444, k = 14$) were somewhat more

strongly related to WA than perceived stress ($\bar{r} = -.347, k = 13$). WA measure type did not moderate the relation between WA and strain, but occupation type did, such that strain was more strongly related to WA for white-collar ($\bar{r} = -.481, k = 8$) versus blue-collar occupations ($\bar{r} = -.309, k = 10; Q = 4.54, p = .03$).

Exit intentions and behaviors. Exit intentions were negatively related to WA ($\bar{r} = -.263, k = 21$) and were operational-

Table 6

Mixed-Effects Meta-Analytic Estimates of the Relationships Between WA and Its Antecedents and Outcomes (by Occupation)

Theoretical outcome	k	N	\bar{r}	95% CI \bar{r}		White vs. Blue collar Q	White collar vs. Nursing Q	Blue collar vs. Nursing Q
				LL	UL			
Job attitudes						.07	.58	.24
White collar	5	3,342	.262	.173	.347			
Blue collar	4	675	.242	.122	.356			
Nursing/Healthcare	3	8,318	.216	.105	.321			
Strain						4.54*	.38	1.19
White collar	8	7,237	-.481	-.569	-.382			
Blue collar	10	3,365	-.309	-.407	-.204			
Nursing/Healthcare	6	3,230	-.431	-.542	-.307			
Fatigue								.94
Blue collar	3	670	-.339	-.547	-.093			
Nursing/Healthcare	4	1,097	-.482	-.639	-.286			
Motivation						3.49†		
White collar	6	3,871	.220	.066	.364			
Blue collar	3	1,647	.437	.244	.597			
Exit behaviors						.90		
White collar	5	3,189	-.271	-.424	-.103			
Blue collar	5	7,318	-.310	-.458	-.145			
Future disability						.29		
White collar	3	1,738	-.324	-.498	-.124			
Blue collar	3	1,320	-.362	-.530	-.167			
Exit intentions							2.29	
White collar	4	2,817	-.308	-.482	-.111			
Nursing/Healthcare	10	24,495	-.312	-.476	-.126			

Note. WA = work ability; LL = lower level; UL = upper level. Only comparisons where at least two occupation groups had three or more effect size estimates were assessed. Where the Q values are presented, Q indicates the heterogeneity of the effect size estimates between two occupational groups. For example, the first column reporting a Q value indicates the difference in effect size estimates between studies using white collar versus blue collar employees.

† p < .10. * p < .05.

ized as *turnover intentions* and *retirement intentions*. Retirement intentions ($\bar{r} = -.241, k = 9$) and turnover intentions, ($\bar{r} = -.273, k = 13$) shared similarly sized relations with WA. Exit behaviors were operationalized as future *absenteeism*, *disability status*, and *retirement*. Importantly, in all studies, these effects were estimated longitudinally with work status measured at some point in the future after WA was measured. Overall, exit behaviors were negatively related to WA ($\bar{r} = -.257, k = 20$). Specifically, WA was related to future disability status ($\bar{r} = -.384, k = 6$), absenteeism ($\bar{r} = -.225, k = 13$), and retirement ($\bar{r} = -.189, k = 4$).

The relation between WA and exit intentions trended toward being moderated by WA measure type. Specifically, when using the WAI ($\bar{r} = -.313, k = 15$), studies showed a marginally stronger relation between WA and exit intentions when compared with those using a perceived WA measure ($\bar{r} = -.139, k = 6; Q = 3.35, p = .067$). The relation between WA and exit intentions was not moderated by occupation type. WA measure type did not moderate the relation between WA and exit behaviors. However, WA was more strongly related to future disability status in studies using the WAI ($\bar{r} = -.534, k = 4$) than in those using a perceived WA measure ($\bar{r} = -.236, k = 3; Q = 5.56, p = .018$). Notably, although the relation between WA and future disability status was markedly smaller in studies using a measure of perceived WA, perceived WA still demonstrated a significant relationship with future disability status.

Item-level WA analysis. To further expand upon our investigation of the impact of the WA measure on the nomological network, we also wanted to determine the extent to which individual perceived WA items correlated with the theoretical antecedents and outcomes identified in this study. Based on the available studies, we were able to perform these analyses for the perceived WA item “please rate your current work ability compared with your lifetime best.” Overall, these results were remarkably strong for a single-item indicator. Specifically, job demands ($\bar{r} = -.214, k = 15$) and job resources ($\bar{r} = .172, k = 17$), and health-based personal resources, general health ($\bar{r} = .360, k = 35$), mental health ($\bar{r} = .397, k = 11$), physical health ($\bar{r} = .230, k = 19$), and health behaviors ($\bar{r} = .103, k = 13$) all demonstrated consistent relations with the single perceived WA item. However, when considering psychosocial personal resources, using a longer perceived WA measure demonstrated a substantially stronger relation with WA ($\bar{r} = .275, k = 24$) compared to the single perceived WA item ($\bar{r} = .118, k = 8$). To facilitate greater understanding of individual perceived WA items, we expand upon these findings in Study 2.

Summary of meta-analytic findings. In summary, with the theoretical antecedents of WA, we found that the relations between WA and job demands were generally negative, and the relations between WA and job and psychosocial personal resources were consistently positive. The relations between WA and health-based personal resources were mixed, and WA was negatively related to age. Regarding the theoretical outcomes of WA, we found that WA positively related to job attitudes, performance, and motivation, and negatively related to strain and exit behaviors. Several of these relationships were moderated by WA measure type and/or occupation type.

Measure type moderator. Hypothesis 7 posited that when assessed via the WAI, WA would be more strongly related to

health-based correlates than when assessed via a perceived WA measure. This hypothesis was generally supported. Studies using the WAI showed stronger relations between WA and general health. Current health status was more strongly related to WA among studies using the WAI than those using a perceived WA measure. Last, studies using the WAI showed a stronger relation to future disability status than those using a perceived WA measure. Although these findings are not surprising given the health-indicators imbedded within the WAI, it is important to note that perceived WA measures were also significantly related to the vast majority of these health-focused correlates.

Hypothesis 8 posited that job-related correlates would be more closely related to WA when assessed via a perceived WA measure than the WAI. However, this hypothesis was not supported. In fact, when considering job resources, the relation between WA and job resources was stronger among studies utilizing the WAI compared with those using a perceived WA measure. Thus, perceived WA measures provided similar results compared with the WAI when investigating job-related correlates and did not provide a notable advantage in terms of effect sizes over using the WAI.

Occupation type moderator. There was moderate support for occupation type moderating the relations between WA and its correlates. Specifically, job resources were more strongly related to WA for those working in white-collar as opposed to blue-collar occupations. Drilling down to specific psychosocial job resources, this effect was only present for job control, which was more strongly associated with WA in white-collar than in blue-collar occupations. To a marginal extent, the relation between job resources and WA was also stronger among white-collar than among nursing and health care occupations, but when considering job control specifically, job control was more strongly related to WA in white-collar occupations than in nursing and health care occupations.

Interestingly, when investigating the health-based personal resources of mental health and physical health, both were more strongly related to WA for those working in white-collar occupations than those in blue-collar occupations. In addition, mental health was more strongly related to WA among those working in white-collar occupations than those in nursing and health care occupations. Occupation type also moderated the relation between health behaviors and WA. When comparing blue-collar to nursing and health care occupations, health behaviors overall, physical activity, and smoking were more strongly related to WA among those in blue-collar occupations compared with those in nursing and health care. When comparing white-collar occupations with nursing and health care, there was also a marginally significant difference in the relation between physical activity and WA, such that the relation was somewhat stronger among those in white-collar occupations. Occupation type also moderated the relation between WA and strain, such that strain was more strongly related to WA for white-collar versus blue-collar occupations.

Study 2

Given support from Study 1 for using measures of perceived WA, we wanted to compare perceived WA with similar yet theoretically distinguishable constructs, namely perceived fit, general self-efficacy, and job self-efficacy (Hypotheses 9–11). Although we found in our meta-analysis that WA was related to job self-

efficacy ($\bar{r} = .352$, $k = 6$, $N = 1,666$, 95% CI [.284, .417]) and core self-evaluations ($\bar{r} = .377$, $k = 11$, $N = 5,032$, 95% CI [.294, .455]) we were limited in our ability to examine Hypotheses 9–11 because relatively few studies included the appropriate covariates. Therefore, to evaluate Hypotheses 9–11, we conducted a follow-up study to assess the discriminant validity of perceived WA relative to the theoretically related yet distinguishable constructs of perceived fit, general self-efficacy, and job self-efficacy. In doing so, we evaluated whether perceived WA explained incremental variance beyond perceived fit, general self-efficacy, and job self-efficacy in the following correlates: health, engagement, exhaustion, intentions to apply for disability, dimensions of performance, job satisfaction, affective commitment, and turnover intentions. Note that our focus in Study 2 was perceived WA rather than the WAI given their similar performance with the covariates in Study 1 and the greater likelihood of using perceived WA in organizational research.

Method

Participants and procedure. Data were collected via Amazon's Mechanical Turk (MTurk) from 334 participants using the following requirements, 97% HIT (Human Intelligence Task) approval, English speaking, having current, paid employment, and being located within the United States. To achieve a more age-representative sample, 50 of the participants were restricted to being at least 50 years old. We also included four attention check questions imbedded throughout the survey. After removing participants due to study restrictions and missed attention check items a total of 282 participants remained. Participants were on average 42.79 ($SD = 12.88$) years old, 84.4% white, and 51.4% male, and the majority worked in primarily psychologically (66.7%) or physically and psychologically demanding jobs (25.5%), whereas only 7.8% of participants considered their work to be primarily physically demanding. All participants were employed and worked an average of 38.59 ($SD = 10.47$) hours per week. This project was approved by the IRB at Portland State University, IRB # 184858, titled "Work Ability Construct Validation."

Measures. Unless noted otherwise, items were assessed on a 7-point scale with scales coded to represent higher levels of the assessed construct. All measures demonstrated good internal consistency, greater than $\alpha = .75$. See Table 7 for specific values. *Perceived WA* was evaluated using the four-item measure based on the original subjective assessment of WA from the WAI (Ilmarinen et al., 1991a) and expanded upon by McGonagle and colleagues (2014, 2015). The first item asks participants to rate their "current work ability compared with your lifetime best." The other three items ask about WA relative to specific job requirement domains via the following questions "How do you rate your current work ability with respect to the (a) mental, (b) physical, (c) interpersonal, demands of your job?" These items are scored from (0 = completely unable to work) to (10 = work ability at its best). *Perceived fit* was evaluated using a 9-item measure from Cable and DeRue (2002). A sample item is "My abilities and training are a good fit with the requirements of my job." *General self-efficacy* was evaluated using an 8-item scale developed by Chen and colleagues (2001). A sample item is "When facing difficult tasks, I am certain that I will accomplish them." *Job self-efficacy* was evaluated using the job self-efficacy scale from Rigotti, Schyns,

and Mohr (2008). A sample item is "Whatever comes my way in my job, I can usually handle it."

Perceived health was assessed with four items focused on aspects of one's health. Specifically, we asked participants to rate "Overall, how would you rate your (a) general (b) mental, and (c) physical health?" Similarly, we asked participants to rate "Compared with others your age, how would you rate your health?" Together, these four items served as an indicator of perceived health. *Exhaustion* was assessed via the Oldenburg Burnout Inventory (Demerouti et al., 2001). A sample item is "During my work, I often felt emotionally drained." *Disability intentions* were evaluated with three items adapted from the Hom, Griffeth, and Sellaro (1984) retirement intentions scale. *Engagement* was evaluated using the nine-item version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Salanova, 2006). A sample item is "At my work, I feel bursting with energy." *Task performance* was evaluated with three items from Griffin and colleagues (2007). This measure included items such as "In my job, I carry out the core parts of my job well." *Organizational citizenship behaviors* toward the organization (OCBO) and the individual (OCBI) were assessed with seven items each from the scale by Williams and Anderson (1991); sample items included "At work, I help others who have heavy workloads" (OCBI) and "Give advanced notice when unable to come to work" (OCBO). *Job satisfaction* was assessed with three items from Cammann, Fichman, Jenkins, and Klesh (1979) such as "In general, I like working here." *Affective organizational commitment* was assessed with eight items from Allen and Meyer (1990), "I really feel as if this organization's problems are my own." *Turnover intentions* were assessed with three items adapted from Hom and colleagues (1984), including "I often think about quitting this organization."

Analytical strategy.

Hierarchical regression. To evaluate Hypotheses 9 and 10, we used hierarchical regression and supplemented those analyses with dominance analysis. Specifically, in steps 1–3 of each hierarchical regression model, perceived fit, general self-efficacy, and job self-efficacy were added sequentially to the equation. In Step 4, perceived WA was added to the equation to determine if perceived WA explained unique variance in one of the correlates (e.g., burnout, OCBO). Because of the potential for multicollinearity among the predictor variables, we also assessed the variance inflation factor (VIF). When including all four variables in Step 4, the VIF for each variable remained comfortably under the conventional rules of thumb in which a VIF of 10 is considered severe (Marquardt, 1970) and a VIF of 5 is considered potentially concerning (Menard, 1995). General self-efficacy and job self-efficacy showed the highest collinearity with VIFs equal to 2.60 and 2.55, respectively, whereas perceived fit and perceived WA showed less multicollinearity with VIFs equal to 1.24 and 1.45, respectively. Further, removing either general self-efficacy or job self-efficacy from the regression model did not change the pattern of results regarding the unique variance explained by perceived WA.

Dominance analysis. To estimate the relative importance of perceived WA in comparison to other self-perception variables (i.e., perceived fit, general self-efficacy, job self-efficacy), we used dominance analysis. Dominance analysis estimates of the average contribution of each correlate across all possible regression models. Thus, dominance analysis can answer the question, which

Table 7
Means, Standard Deviations, and Correlations Among Variables in Study 2

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. PWA	8.23	1.35	(.81)																						
2. Current WA	8.14	1.49	.84**																						
3. Mental WA	8.30	1.61	.82**	.70**																					
4. Physical WA	8.43	1.90	.77**	.43**	—																				
5. Int. PWA	8.05	1.75	.78**	.51**	.43**	—																			
6. WAI	41.26	6.15	.61**	.66**	.57**	.44**	—																		
7. General SE	5.68	1.06	.53**	.53**	.52**	.37**	.46**	—																	
8. Job SE	5.92	0.81	.51**	.50**	.53**	.31**	.41**	.76**	—																
9. Perceived fit	5.19	1.09	.27**	.24**	.25**	.10	.30**	.19**	.40**	—															
10. Perc. Health	5.54	1.20	.50**	.50**	.48**	.23**	.39**	.67**	.45**	.35**	—														
11. Gen. health	5.57	1.22	.48**	.52**	.43**	.28**	.35**	.63**	.37**	.31**	.26**	—													
12. Phys. health	5.53	1.28	.44**	.48**	.36**	.27**	.33**	.57**	.29**	.23**	.20**	.90**	—												
13. Mental health	5.54	1.49	.43**	.44**	.49**	.12*	.37**	.58**	.51**	.40**	.30**	.81**	.62**	—											
14. Rel. health	5.51	1.40	.44**	.51**	.40**	.19**	.33**	.60**	.40**	.29**	.21**	.93**	.84**	.83**	—										
15. Dis. int.	1.56	1.08	-.41**	-.45**	-.32**	-.30**	-.25**	-.60**	-.25**	-.23**	-.17**	-.43**	-.41**	-.43**	-.31**	-.39**	—								
16. Exhaustion	3.43	1.12	-.49**	-.46**	-.45**	-.33**	-.33**	-.52**	-.53**	-.47**	-.47**	-.48**	-.42**	-.38**	-.51**	-.36**	.31**	—							
17. Engagement	5.00	1.26	.39**	.39**	.35**	.20**	.33**	.35**	.51**	.44**	.69**	.40**	.35**	.28**	.45**	.34**	.19**	.60**	—						
18. Task perf.	6.19	0.74	.46**	.41**	.45**	.34**	.28**	.29**	.53**	.56**	.21**	.26**	.21**	.27**	.21**	.21**	.22**	.34**	.30**	—					
19. OCBI	5.49	0.96	.43**	.39**	.36**	.27**	.36**	.26**	.55**	.50**	.35**	.22**	.17**	.10	.30**	.19**	.19**	.30**	.48**	.42**	—				
20. OCBO	5.90	0.81	.42**	.34**	.38**	.31**	.32**	.29**	.34**	.41**	.31**	.28**	.26**	.19**	.33**	.22**	.26**	.34**	.36**	.54**	.43**	—			
21. Job sat.	5.19	1.53	.31**	.33**	.29**	.12*	.27**	.31**	.44**	.41**	.77**	.33**	.28**	.20**	.42**	.26**	.17**	.53**	.80**	.33**	.26**	.70**	—		
22. Affective C.	4.52	1.44	.22**	.21**	.18**	.05	.29**	.18**	.30**	.29**	.74**	.25**	.19**	.17**	.28**	.22**	.16**	.43**	.69**	.10	.41**	.27**	.70**	—	
23. Turnover int.	3.27	1.94	-.18**	-.18**	-.19**	-.02	-.21**	-.18**	-.22**	-.22**	-.67**	-.18**	-.15**	-.12**	-.25**	-.13*	.14*	.40**	-.61**	-.13*	-.19**	-.23**	-.72**	-.74**	

Note. N = 282. PWA = mean from the four-item measure of perceived WA (McGonagle, Fisher, Barnes-Farrell, & Grosch, 2015); OCBO = organizational citizenship behaviors toward the organization; OCBI = organizational citizenship behaviors toward the individual; Current WA = current work ability compared with lifetime best; Mental WA = current work ability with respect to mental demands; Physical WA = current work ability with respect to physical demands; Interpersonal WA = current work ability with respect to interpersonal demands; WAI = Work Ability Index; General SE = general self-efficacy; Job SE = job self-efficacy; Perc. health = Perceived Health Scale (four items); Gen. health = general health (one item); Phys. health = physical health; Mental health = mental health; Rel. health = relative health. Dis. int. = disability intentions; Task perf. = task performance; Job sat. = job satisfaction; Affective C. = affective commitment; Turnover int. = turnover intentions. M and SD are used to represent mean and standard deviation, respectively. Values in parentheses on the diagonal of the correlation matrix represent internal consistency (α). * $p < .05$. ** $p < .01$.

Table 8
Sequential Multiple Regression Models Examining Incremental Variance Explained by Perceived WA in Relation to Correlates Over and Above Perceived Fit, General Self-Efficacy, and Job Self-Efficacy

Measure	Perceived health		Exhaustion		Disability intentions		OCBO		OCBI	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Perceived fit	.11**	.07	-.29**	.22	-.05	.03				
GSE	.16**	.08	-.27**	.14	-.03	.04				
JSE	-.07	.00	-.02	.00	.01	.00				
PWA	.40**	.11	-.20**	.05	-.38**	.10				
Total R^2		.26		.41		.16				

Measure	Engagement		Task performance		OCBO		OCBI	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Perceived fit	.58**	.48	-.06	.05	.15*	.09	.12*	.12
GSE	.26**	.07	.18*	.23	-.05	.06	.31**	.20
JSE	.06	.00	.34**	.06	.23**	.04	.14	.01
PWA	.12*	.01	.21**	.03	.29**	.06	.16**	.02
Total R^2		.55		.37		.23		.35

Note. WA = work ability; OCBO = organizational citizenship behaviors toward the organization; OCBI = organizational citizenship behaviors toward the individual. Total $N = 282$. GSE = General self-efficacy; JSE = Job self-efficacy; PWA = perceived work ability; β = standardized regression coefficients, and ΔR^2 = change in R^2 in Step 4 of each regression model with the final addition of perceived work ability (all variables included). * $p < .05$. ** $p < .01$.

variables are most important for predicting a given outcome. The average contribution of each variable is referred to as the general dominance value. The general dominance value can be rescaled by dividing the general dominance value by the total R -squared for the overall model, resulting in the proportional average contribution of each variable (Azen & Budescu, 2003; Budescu, 1993). In this case, each rescaled dominance value indicates the average contribution of each self-perception variable in incremental predictive utility for one correlate of interest.

Model comparisons. To directly test Hypothesis 11a–11c, a model comparison approach was used to evaluate the incremental effects of perceived WA across the three types of outcomes (i.e., health, performance, job attitudes). In this approach, the 10 outcomes were simultaneously regressed on the four predictors (i.e., perceived fit, general self-efficacy, job self-efficacy, perceived WA), providing 40 partial regression slopes, 10 of which are of interest for this study (i.e., the partial regression slopes between perceived WA and the 10 outcomes). Because these partial regression slopes condition on the same predictor variables, their magnitudes are directly comparable when the data are standardized (cf. Bodner, 2018). To overcome differences in outcome variable valence, disability intentions, exhaustion, and turnover intentions were reverse scored. The model comparison approach compares the fit of two competing and nested statistical models using a chi-square difference test. In the more constrained model, all partial regression slopes for the compared outcome variable types are forced to be equal; in the less constrained model, only the partial regression slopes within a compared outcome variable type are forced to be equal (i.e., slope can vary across the compared types). Rejection of the null hypothesis underlying the chi-square difference test implies that the partial regression slopes differ in magnitude across the outcome types.

Results

Given the results of Study 1 suggesting that perceived WA measures are often comparable with the WAI, and the value to organizations of measuring perceived WA as opposed to the WAI (e.g., legal and practical concerns), Study 2 focused on perceived WA. However, here we provide a descriptive overview of the associations between the WAI and perceived WA (see Table 7 for the Study 2 correlation matrix). The relationship between perceived WA and the WAI was $r = .61$. Descriptively the WAI was more strongly related to health-related correlates (e.g., perceived health; $r = .67$) compared with measures of perceived WA ($r = .50$). However, perceived WA was more strongly related to performance indicators (e.g., $r = .39$ – $.46$) than the WAI ($r = .26$ – $.35$), an interesting pattern. Despite the specific differences, the magnitude of other relations were very similar regardless of which WA measure is used. Regarding its associations with other self-perception variables, perceived WA was related to general self-efficacy ($r = .53$), job self-efficacy ($r = .51$), and perceived fit ($r = .28$). At the item level, the perceived WA items focused on (a) current WA relative to lifetime best, (b) mental demands, and (c) interpersonal demands were significantly related to each correlate of interest, whereas the perceived physical WA item was only significantly related to some correlates. Given that relatively few participants were in primarily physically (7.8%) or physically and mentally demanding job (25.5%), this pattern is perhaps not surprising.

Results for Hypotheses 9 and 10. Regarding Hypotheses 9 and 10, that perceived WA will explain incremental variance in health- and performance-related correlates, we found support for both hypotheses (see Table 8 for results of the regression models and Table 9 for the results of the dominance analyses). Specifically, perceived WA explained unique variance in perceived health ($\beta = .40$, $\Delta R^2 = .11$, $p < .001$), exhaustion ($\beta = -.20$, $\Delta R^2 =$

Table 9
Dominance Analysis With Four Self-Perception Constructs and Outcomes

Model	Model R^2	Additional contribution of			
		General self-efficacy	Job self-efficacy	Perceived fit	Perceived WA
Perceived health	.31				
General dominance		.09	.04	.03	.15
Rescaled dominance		.29	.12	.09	.49
Disability intentions	.17				
General dominance		.02	.02	.01	.13
Rescaled dominance		.12	.10	.06	.73
Exhaustion	.41				
General dominance		.12	.07	.12	.11
Rescaled dominance		.28	.17	.29	.26
Engagement	.55				
General dominance		.34	.11	.06	.05
Rescaled dominance		.61	.19	.11	.09
OCB-I	.35				
General dominance		.13	.10	.05	.07
Rescaled dominance		.38	.28	.13	.21
OCB-O	.25				
General dominance		.04	.07	.04	.10
Rescaled dominance		.15	.29	.17	.39
Task performance	.37				
General dominance		.12	.15	.01	.09
Rescaled dominance		.31	.41	.04	.25

Note. WA = work ability; OCBO = organizational citizenship behaviors toward the organization; OCB-I = organizational citizenship behaviors toward the individual. $N = 282$. Rescaled dominance = general dominance divided by the overall model R^2 .

.05, $p < .001$), and disability intentions ($\beta = -.38$, $\Delta R^2 = .10$, $p < .001$). Thus, after accounting for general self-efficacy, job self-efficacy, and perceived fit, PWA explained a substantial portion of additional variance, including 11% in perceived health, 10% in intentions to apply for disability, and 5% in exhaustion. Dominance analysis indicated that perceived WA explained the most variance in health (rescaled dominance value = .49, model $R^2 = .31$) and disability intentions (rescaled dominance value = .73, model $R^2 = .17$), and the second most variance in exhaustion (rescaled dominance value = .26, model $R^2 = .41$).

Regarding the performance-related correlates, perceived WA again explained incremental variance beyond perceived fit, general self-efficacy, and job self-efficacy in engagement ($\beta = .12$, $\Delta R^2 = .01$, $p = .013$), task performance ($\beta = .21$, $\Delta R^2 = .03$, $p < .001$), OCBOs ($\beta = .29$, $\Delta R^2 = .06$, $p < .001$), and OCBIs ($\beta = .16$, $\Delta R^2 = .02$, $p = .006$). As such, perceived WA explained 6% of the incremental variance in OCBOs, a nontrivial amount, while also explaining 1% to 3% of incremental variance in task performance, engagement, and OCBIs. Based on dominance analysis, the rescaled dominance values were as follows: .09 of the $R^2 = .55$ for engagement, .25 of the $R^2 = .37$ for task performance, .21 of the $R^2 = .35$ for OCBIs, and .39 of the $R^2 = .25$ for OCBOs.

Results for Hypotheses 11a–11c. Based on model comparisons, Hypotheses 11a–11c were supported. Specifically, for Hypothesis 11a, the model permitting differences in the partial associations between perceived WA and the health ($\beta = .33$, $p < .001$) and performance correlates ($\beta = .18$, $p < .001$) fit significantly better than a model forcing these partial associations to be equal across outcome types ($\Delta\chi^2(1) = 9.70$, $p = .002$). In terms of Hypothesis 11b, the model comparing the health ($\beta = .32$, $p < .001$) and job attitude correlates ($\beta = .01$, $p = .716$) fit significantly

better than a model forcing these partial associations to be equal across outcome types ($\Delta\chi^2(1) = 48.31$, $p < .001$). Finally, for Hypothesis 11c, a model permitting differences in the partial associations between perceived WA and performance ($\beta = .16$, $p < .001$) and attitudinal ($\beta = .02$, $p = .263$) correlate types fit significantly better than a model forcing these partial associations to be equal across outcome types ($\Delta\chi^2(1) = 16.06$, $p < .001$). Taken together, these results suggest that the relations with perceived WA are strongest among health-related correlates, but smaller in magnitude for performance-related correlates, and weakest between perceived WA and job attitude correlates, when accounting for perceived fit, general self-efficacy, and job self-efficacy.

General Discussion

With its origins in occupational medicine, the concept of WA has recently taken root in the organizational psychology literature. However, the WA concept suffers from multiple definitions and operationalizations across disciplines, and several measures have emerged, some with questionable psychometric and theoretical qualities. The present study addresses these issues by providing a quantitative summary of the WA literature and an examination of the measurement of WA, thereby advancing the literature on WA in several ways. First, it provides the most comprehensive quantitative synthesis of the WA literature to date, reaching across the domains of organizational psychology and occupational medicine and including hundreds of studies, thousands of individuals, and multiple occupations. Second, this analysis allowed us to compare perceived WA measures and the WAI in terms of their relationship with dozens of theoretical antecedents and outcomes of WA, far

beyond the most comprehensive past examinations of WA (e.g., McGonagle et al., 2015). In this way, this study clarifies the WA construct. Third, this study examines whether measures of perceived WA, which have been introduced recently as more psychometrically sound and relatively easy to administer, have a notably different nomological network than the long-established WAI. Fourth, this study investigates the moderating role of occupation type as a boundary condition to determine whether the correlates of WA vary by occupational group. Fifth, we provide an in-depth examination of perceived WA at the item level and show the unique variance explained by perceived WA compared with the conceptually related constructs of perceived fit, general self-efficacy, and job self-efficacy. We discuss each of these contributions below.

Conceptual Clarification of Work Ability

Unlike previous research, we argue that WA as a construct is relatively straightforward, representing *an individual's ability to continue working in their job*. As such, WA answers the fundamental question, "Can a person fulfill the basic and essential functions required for a given job?" Thus, at its core assessing WA must consider both an individual's abilities and their contextual workplace factors (e.g., demands of their job). Similar to nearly all constructs studied in the organizational sciences, providing a self-assessment of WA, such as perceived WA, is a highly pragmatic approach which also provides great utility for understanding a wide range of related constructs. Moreover, perceived WA is perhaps the best method of assessing WA as it is inherent that one's ability to work in a given role may be most accurately assessed by the individual tasked with working in such role. That said, including assessments of objective WA would be reasonable, but only to the extent that those objective indicators are reasonably matched to the occupational context. In an analogous manner, we could evaluate job performance by self-report, supervisor ratings, or an objective indicator (e.g., sales per month). In each case, a piece of information is being collected to assess performance. Similarly, WA may be evaluated through different sources, but ultimately should reflect the underlying construct of "an individual's ability to continue working in their job."

Synthesis of the WA Literature and Theory of Work Ability

To date, there has been minimal integration of the medical and organizational psychology literatures on WA, and each has developed and investigated WA within its respective silo. We have bridged this gap by integrating the findings across these disciplines, reflecting the breadth of research investigating WA.

Theoretical antecedents of WA. We found strong support for conceptualizing the nomological network of WA through the lens of the JD-R. Specifically, job demands were negatively related to WA, whereas job and personal resources were positively related to WA. Similar to McGonagle et al. (2015), we found stronger relations between WA and personal resources, with health-related personal resources having particularly strong relationships with WA. However, we also expanded upon McGonagle et al.'s (2015) original set of theoretical antecedents in many ways. Specifically, we found that job factors of an interpersonal nature, such as

perceived justice and workplace mistreatment, as well as psychosocial personal resources, such as nonwork social support, cognitive functioning, coping, and SOC behaviors are also important to consider when investigating WA. In addition, we highlighted specific health focused behaviors (e.g., physical activity, refraining from smoking) that are related to WA and thus might be used to promote it. Finally, we also investigated the utility of objective health indicators (e.g., glucose levels), as alcohol consumption, finding that they showed weak or nonsignificant relations with WA. Ultimately, this work greatly expands upon the theoretical antecedents identified as important for WA in previous research.

Theoretical outcomes of WA. The present study also examined the relationship between WA and a number of attitudinal (e.g., job satisfaction, commitment), motivational (e.g., engagement), strain-related, and behavioral (e.g., performance, exit behaviors, future disability status) outcomes. Specifically, we found that WA was a predictor of all of these outcomes, many of which—work engagement, strain, work motivation, and performance—had not been summarized in previous research on WA (e.g., McGonagle et al., 2015). Thus, this research situates WA as an important construct to consider not only when investigating employee exit behaviors, but also in contexts related to promoting motivation, reducing strain, and improving job attitudes and performance.

Comparison of the WAI Versus Perceived WA

Comparing the WAI with measures of perceived WA and thus developing WA theory by empirically evaluating its nomological network was a critically important goal of our study. We found that the type of WA measure only moderated the relationship between WA and its correlates in five of the 58 assessed relationships; that is, the type of WA measure generally had little effect on the study results. That said, two health-focused variables, current health status and exit from the workforce via disability or pension status, were more strongly related to the WAI than to perceived WA, which is not surprising given that the WAI includes an in-depth assessment of health problems. Thus, although the relation between perceived WA and future disability status was still significant, perceived WA may be less useful for predicting disability pension claims, specifically. That said, most differences found between perceived WA and the WAI were relatively small, suggesting that perceived WA could serve as a useful and far simpler measure than the WAI. In addition, we argue that researchers would be better served assessing perceived WA in conjunction with measures of health (e.g., condition checklist, self-rated health), as opposed to using the WAI in which perceived WA and health are intertwined within the measure. This approach would likely retain the additional predictive power associated with the WAI, while allowing researchers to gain a more nuanced understanding of the antecedents of future disability status. Further, given the relative brevity of administering measures of perceived WA and invasiveness of the WAI (requiring information about specific and personal medical conditions), we believe that organizational researchers are better served using measures of perceived WA for most purposes.

Our meta-analytic analysis of the single item "current WA compared with your lifetime best" demonstrated surprisingly consistent relations among important correlates of interest (e.g., job

demands, job resources, health). Although, there were also some notable differences, such as psychosocial personal resources being more strongly related to longer measures of perceived WA, this finding suggests that the *current* WA item is quite important for measures of perceived WA. Indeed, the item analysis from Study 2 showed that while three WA items—current, mental, and interpersonal—were significantly related to the correlates of WA, the physical WA item showed the weakest pattern and was uncorrelated with the outcomes of organizational commitment and turnover intentions. Given that Study 2 consisted of relatively few workers in primarily physically demanding occupations, the item WA *in relation to the physical demands of your job* may not map well onto the study sample, and thus may be less valuable in that context.

Taken together, although we view the measurement of WA as an area ripe for future research, one measure of perceived WA that we view as promising is the four-item measure adapted from the WAI by McGonagle and colleagues (2014, 2015). Previous studies of perceived WA have considered current WA compared with one's lifetime best, current WA relative to specific demands (e.g., mental, physical), and anticipated future WA. However, based on the conceptual definition we have provided, we argue that focusing on perceptions of current ability with respect to occupational demands is the most theoretically sound approach to assessing WA. Thus, to properly assess WA among employees across a range of occupations, the four item measure from McGonagle and colleagues (2015) may be ideal as it taps overall current WA, and a range of demand domains. On the other hand, modifying the measure to be more targeted, focusing on overall and physical WA may be best for jobs that involve overwhelmingly physical occupations (e.g., construction workers, trade jobs), and dropping the physical demands item may be warranted in cases where very few physical demands are present.

Occupation Type as a Moderator

Researchers have largely viewed certain occupations as a risk factor for poor WA (Ilmarinen et al., 1991a, 1997), and we expanded on this research by investigating the moderating role of occupation type. Notably, the occupation type moderator was relatively coarse in nature (e.g., comparing only jobs that were primarily mentally or physically demanding, as well as nursing and health care specifically), and thus, a more nuanced approach to aligning specific demands with specific facets of WA would be an excellent extension of the present studies in future research. Specifically, future research should explore the nuances between the dimensions of perceived WA measures (e.g., mental, physical, interpersonal WA) to more nuanced occupational contexts as this would shed additional light on distinctiveness and overlap of the importance of WA across dimensions. Despite the coarseness of the occupation moderator, we found that occupation type served as a moderator in a number of instances. Specifically, mental health, job control, and strain were more strongly related to WA among those in white-collar occupations compared with those in blue-collar occupations. Reflecting on these findings, there appears to be support for a matching paradigm between considering the demands of occupational contexts and correlates that are more strongly related to WA within that context. That is, white-collar occupations are

characterized as being primarily mentally demanding occupations, and we found evidence that mental health is a more important resource for white-collar workers compared with blue-collar workers. Similarly, within blue-collar occupations and nursing/health care following specific safety protocols may be quite important, and as such, job control may be markedly less important for WA. Similarly, strain is most often measured as a perceptual indicator and focuses on mental fatigue or burnout and, as such, may be most important when considering WA among white-collar workers compared with blue-collar workers.

Other findings regarding occupation as a moderator were less straightforward. Specifically, physical health was *less* strongly related to WA among samples of blue-collar workers. This finding contradicts a matching paradigm. That is, physical health should be a resource for blue-collar workers to meet the physical demands of their job. When comparing health care workers with those in white-collar and blue-collar occupations we also found interesting results. Mental health was more strongly related to WA among white-collar workers, and there were marginally significant differences in the relations between BMI, pain symptoms, and physical activity, such that each were somewhat more strongly related to WA among white collar workers compared with nursing/health care workers. Further, physical activity and refraining from smoking were more strongly related to WA among those in blue-collar occupations than those in nursing/health care. Again, in some ways these findings are surprising. Health care is characterized as being particularly demanding, often encompassing long shifts and high levels of mental, physical, and emotional demands. Thus, high levels of mental health, engaging in positive health behaviors, lower BMI, and not having pain symptoms should be extremely important for health care workers. To explain these noted discrepancies, we posit that workers within blue-collar occupations and those in health care may be more similar to one another—not necessarily because of the occupation per se but because of self-selection and attrition. That is, if workers in either field are unable to meet the demands of their job, physical demands for blue-collar workers, and overall taxing working conditions for health care, they may exit the workforce entirely or shift their careers to find a better fit with their abilities. Indeed, nursing in particular has struggled to retain nurses because of the high-demand nature of the job (Buerhaus, Donelan, Ulrich, Norman, & Dittus, 2006), an issue even more important to consider for younger nurses (Symes et al., 2005). Taken together, this pattern of results suggests the need to work further upstream, by taking active steps to promote WA earlier in workers' careers and rehabilitate those experiencing low WA, steps which will be increasingly important as the workforce ages, and for specific occupations (e.g., nurses, trade workers).

Perceived Work Ability and Related Constructs

In addition to synthesizing the WA literature, we have also provided evidence of the predictive validity of WA and the unique value of WA in relation to the perceptual constructs of perceived fit, general self-efficacy, and job self-efficacy. We found in our meta-analyses that perceived WA predicted future disability status, albeit to a lesser extent than the WAI, and that measures of perceived WA predicted other exit behaviors, strain, job satisfac-

tion, and performance in a similar manner to the WAI. The results of Study 2 further demonstrated that perceived WA can also explain unique variance in important personal and organizational variables. Specifically, perceived WA explained unique variance beyond self-efficacy and perceived fit in health, engagement, strain, task performance, OCBI, and OCBO. Interestingly, when accounting for related self-perception measures, perceived WA appears to be most useful for investigating health related constructs, provides some incremental predictive utility regarding performance-related constructs, and is least useful for evaluating job attitudes. Taken together these findings further demonstrate two key ideas. First, WA, even when assessed via perceived WA, is distinct from the aforementioned related constructs. Second, despite being conceptually related to the established constructs of self-efficacy and perceived fit, the results of Study 2 showed that perceived WA is important to consider in its own right and can provide unique value in explaining variance in a number of covariates beyond that of established perceptual variables.

Practical Implications

This study highlights the importance of WA to outcomes valued by society, organizations, and workers. Accordingly, it suggests potential leverage points for organizations to help support the WA of their workforce. These include reducing demands, increasing resources, and promoting individual behavior change efforts (e.g., exercising, smoking cessation). This study demonstrates that although in many cases the resources and demands to address are consistent across occupational groups, there are a number of areas where targeted approaches may be most influential. For example, job control is in many ways hailed as a panacea for promoting worker wellbeing, but demonstrated only modest relations with WA among blue-collar occupations and was more important for WA among white-collar workers than those in nursing and health care. Further, the results of this study point to WA as an important focal variable for interventions aimed at improving worker wellbeing, performance, and successful aging. Indeed, interventions to promote WA often focus on health-based factors (Pohjonen, 2001), but have begun to include more psychosocial factors (Elo, Ervasti, Kuosma, & Mattila, 2008; Müller, Weigl, Heiden, Glaser, & Angerer, 2012), a trend that is supported by our research and for which the present study identifies some specific points of leverage outside of commonly studied strategies (e.g., promoting fairness, nonwork social support, sleep, focusing on mental health, and SOC behaviors).

The present research also demonstrates that relatively short and simple measures of WA can be valuable to employers as a diagnostic tool to take the pulse of their employees' ability to meet job demands. That is, perceived WA can explain unique variance in important organizational constructs (e.g., engagement, health, performance, intentions to apply for disability). Further, generally speaking, assessing perceived WA requires fewer items (e.g., four items; McGonagle et al., 2015) than established measures such as of perceived fit (nine items; Cable & DeRue, 2002), general self-efficacy (eight items; Chen et al., 2001), or job self-efficacy (six items; Rigotti et al., 2008; or eight items; Chen, Goddard, & Casper, 2004), suggesting the utility of perceived WA in organizational research.

Finally, given WA's predictive power, from a societal perspective monitoring the WA of the workforce could provide an economic advantage to countries and societies wishing to maintain a high-functioning workforce, while simultaneously increasing wellbeing and reducing medical, disability, and retirement costs. Indeed, as industrialized workforces age, promoting WA will be an increasingly important focus for organizations, but also for the wellbeing of societal systems (e.g., retirement and health care systems). In other words, the utilization and tracking of WA across multiple levels of analysis can have a significant impact on the workforce at the individual, organizational, and societal levels.

Limitations and Future Directions

Although this study makes several important contributions, it does have some limitations. First, particularly when drawing on literature from the field of occupational medicine, some measures of WA and its correlates used relatively weak measures (e.g., single-item indicators). These measures are frequently used in the medical literature, which often categorizes data in ways that lose information (e.g., creating categories from continuous scales). However, despite these limitations, we still found strong support for nearly all of our hypothesized direct relationships, and in several cases, we identified moderators. Further, the relatively weak measures used in past research may in fact underestimate the observed relations relative to the true relations among WA and its correlates.

Second, our meta-analytic investigation was sometimes limited by the available data. As such, there are several variables that may be related to WA and are important for organizations, but we were unable to assess them because there were an insufficient number of studies that did so. Two notable examples stood out to us. First, personal resources were identified as among the most strongly related to WA. However, a large number of personality variables have not been assessed in relation to WA (e.g., proactivity, adaptability, openness, agreeableness, extraversion, and emotional intelligence). Second, although we were able to establish a relationship between WA and job performance, additional research linking WA to non-self-report measures of job performance, distinguishing among different types of performance (e.g., organizational citizenship behaviors, task performance, objective indicators of performance, and counterproductive work behaviors), and identifying moderators to the WA to performance relation are particularly important areas for future research.

Finally, although we have presented our findings within the JD-R theoretical framework, which implies directionality and poses the potential for moderating effects between demands and resources, our meta-analytic investigation does not test each tenet of this theory. Specifically, moderating effects were not examined between demands and resources as we did not have the primary data available to conduct such analyses. Future research should address this potential gap. In addition, this meta-analytic investigation contains studies that are both cross-sectional and longitudinal and thus does not allow us to confirm directionality. For example, it is probable that the relationship between health and WA and WA and performance may be reciprocal. Although this is a concern, it is important to note that in several cases, such as in predicting future disability claims and retirement, the effect size estimates were based entirely on longitudinal studies with WA

assessed at one time point and employment status at later time point. Further, in some studies, the length of time between measurement points was more than 10 years, which is remarkable in its own right and bolsters our argument that the hypothesized effects do indeed occur in the discussed temporal order. Despite evidence suggesting the temporal manner of these relationships, we view the causal nature of these relations as a gap that warrants more research.

Conclusion

Prior to this meta-analytic investigation, the literature on WA was lacking an integrated synthesis of the empirical research. The wide range of measures used to assess WA and the absence of a nomological network made it difficult to utilize this promising construct to its full potential. In this paper, we have identified personal and contextual factors associated with WA using the JD-R framework. We found that WA is a useful predictor not only of worker attitudes and intentions, but also of critical work and health-related behaviors such as turnover and disability. Although we found specific instances where the WAI measure may hold stronger predictive power than measures of perceived WA, our general finding is that significant relationships between WA and its theoretical antecedents and outcomes are present regardless of the WA measure used. Finally, we assessed the important potential moderator of occupation to determine if correlates of WA vary across occupational contexts. Taken together, these findings suggest that employers, workplace researchers, and practitioners should utilize measures of WA as a workforce management tool to anticipate future employee and organizational human resource needs, promote positive job attitudes, and enhance engagement and performance. Preventive use of WA measures can facilitate the development of interventions to maintain and enhance employees' work ability before significant problems arise. In the context of today's aging workforce and expected trend of lower workforce participation (Toossi, 2015; United States Bureau of Labor Statistics, 2017), this study provides the synthesis and direction needed to move this area of research forward, promoting the WA and sustained health of individuals and organizations.

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Appendix

Construct Definitions and Groupings for Analyses

Variable label	Operationalization
Job demands	Any workplace factor that requires sustained effort, skill, or energy. These include all of the following demands as well as measures that assessed demands using a measure assessing multiple job demands.
Quantitative demands	Workplace factors dealing with time or quantity focused requirements for work. Examples are time pressure and workload.
Mental/Emotional demands	Any workplace factor dealing with requirements that are mentally or emotionally focused. Examples include role ambiguity, role conflict, and surface acting.
Physical demands	Workplace factors indicating physical requirements to accomplish a job. Examples include self-ratings of physical demands and ratings of specific physical tasks (e.g., time spent lifting heavy objects).
Environmental conditions	Conditions in which the work is being performed where the broader workplace environment would cause additional resource use, or be taxing to an individual beyond the work task itself. Examples include hot and humid working conditions or noisy work environments.
Workplace mistreatment	Any act of mistreatment or hostility aimed at the focal employee from clients, coworkers, or supervisors. These can include verbal, physical, or combined measures of mistreatment or conflict.
Job resources	Any aspect of the job that aids in individuals accomplishing work goals or facilitates personal growth. These include each specific resource listed below and measures of combined or general job resources.
Coworker support	Indicators of emotional, instrumental, or general support from colleagues and coworkers.
Supervisor support	Indicators of support or a positively functioning relationship with one's supervisor. Examples include ratings of perceived supervisor support and a high quality relationship with one's supervisor.
Job control	Any aspect of control the focal employee has over their job tasks, schedule or other aspects of their work. Examples include autonomy, schedule control, and broader ratings of job control.

(Appendix continues)

Appendix (continued)

Variable label	Operationalization
Task resources	Task-specific factors in a job that are helpful in accomplish work tasks or aiding in personal growth. Examples include task significance and task variety.
Rewards	Monetary and social rewards, including pay raises, promotions, and acknowledgement or praise for performing well at work.
Justice perceptions	Ratings of fairness or perceived equality in organization procedures, decision making, interpersonal interactions. Examples include effort-reward balance, organizational justice.
Org. climate	Individual-level ratings of positive general or specific work climates including social, safety, or other perceptions of work climate.
Psychosocial personal resources	Personal (non-health) factors that are helpful in accomplishing work goals or stimulating personal growth. Also included are the absence of negative traits (e.g., neuroticism).
Core self-evaluations	Any rating of beliefs in one's ability, ability to overcome challenges, or positive view of themselves. Examples include self-efficacy, self-esteem, or general core self-evaluations.
Job self-efficacy	Any rating of job specific self-efficacy. Such as belief in one's ability to overcome challenges at work.
Conscientiousness	Ratings assessing the Big Five personality indicator conscientiousness, which includes ratings of dutifulness, attention to detail, planning, and achievement striving.
Positive traits (e.g., optimism)	Personal traits or dispositions that are generally viewed as positive and would likely be helpful in accomplishing work tasks. Examples include positive affectivity and optimism.
Cognitive functioning	Typically established by scores on a test that assesses cognitive functioning such as intelligence tests or working memory tests (e.g., digit span).
Coping	Ratings of behaviors aimed at overcoming, or otherwise dealing with challenging situations and circumstances in one's life. Coded such that positive coping (e.g., active coping is positively coded), and negative coping (e.g., avoidance coping) is negatively coded.
Negative traits (e.g., hostility)	Personal attributes or dispositions that are generally viewed as being negative and would likely hinder one's ability to perform job functions. Examples include neuroticism and hostility.
Grit/Resilience	Specific variables assessing ability to persist through something difficult. Examples include measures of grit and resilience.
SOC behaviors	Indicators of selection optimization and compensation behaviors. Assessed as general SOC behaviors or SOC behaviors directed toward a specific occupation (e.g., nursing SOC behaviors).
Social support (nonwork)	Any indicator of support or high-quality relationships with others outside of the organization (e.g., spousal, family support).
Health-based personal resources	Any indicator of health, objective or subjective.
General health	Any indicator of general health. This includes health conditions, self-rated general health, self-rated health measures that mix mental and physical health, non-pain related symptoms (e.g., nausea), sleep, and previous absenteeism as an indicator of recent poor health.
Symptoms (nonpain)	Specific symptoms that do not involve general pain or fatigue. Examples include nausea and dizziness. Generally taken from a symptom checklist.
Current health status	Being free from any diagnosed health condition. Examples include arthritis, osteoporosis, being a cancer survivor.
Previous absenteeism	Indicator of any previous short- or long-term absence or missed days from the workplace. Examples include number of sick days in the past 12 months.
Sleep	Any indicator of sleep quality, quantity, or overall restfulness of one's sleep.
Mental health	Any indicator of mental health, primarily assessed as anxiety, depression, or a combination of anxiety and depressive symptoms.
Anxiety	Feelings of anxiousness, clinical or non-clinical anxiety symptoms.
Depressive symptoms	Feeling down, reporting disinterest in things that were previously interesting, or other clinical or non-clinical reports of depressive symptoms.
Physical health	Indicators of physical health and functioning.
Physical ability	An individual's test score or performance on a physical task (e.g., sit-up count, mile time).
BMI	Reported body mass index or category of body mass index.
Objective health indicators	Clinical indicators of physical health such as cholesterol, blood pressure, or glucose.
Symptoms (pain-related)	Symptoms of pain or groupings of individuals based on pain symptomology.
Health behaviors	Behaviors known to influence one's health including physical activity, smoking, alcohol use, diet or combined measures.
Physical activity	Any rating of being physically active. Including specific ratings of exercise frequency and duration as well as indicators of being active during leisure time.
Smoking (tobacco)	Assessment of current smoker to non-smoker.
Alcohol consumption	Self-ratings of alcohol consumption.
Job attitudes	Evaluations of one's job that express feelings toward, beliefs about or attachment to one's job.
Job satisfaction	Attitudes focused on one's job or specific aspects of their job and how content the employee is.
Organizational commitment	How much an individual feel obligation to or commitment to one's organization.

(Appendix continues)

Appendix (continued)

Variable label	Operationalization
Over-commitment	Negative type of commitment whereby an individual displays inappropriate perceptions of job demands and coping resources.
Job performance (self-rated)	Ratings of the quality or quantity of one's work including ratings of task performance, OCBs, or related ratings that indicate performance on the job.
Strain	Indicators of low energy, stress, exhaustion, burnout or other strain indicators.
Fatigue	Indicators of a lack of energy, vitality, or similar symptoms of general fatigue.
Burnout	Characterized as emotional exhaustion and depersonalization in line with the definition of burnout used within the job demands-resources model.
Perceived stress	Ratings of perceived stress from general or work specific sources.
Work motivation	Indicators of any form of work motivation, such as engagement, intrinsic motivation, or other indicators of motivation at work.
Exit intentions	Variables assessing one's desire to leave the workforce entirely, the specific occupation, or organization they are working in.
Retirement intentions	Specific intentions to retire in the near future, or indication of a specified intended retirement age (reverse coded for older retirement age meaning lower intentions to retire).
Turnover intentions	The specific desire to leave one's job or occupation, but not necessarily exit the workforce.
Exit behaviors	Any indicator of actual exit from the workforce with work ability measured at one point and exit status at a second point in time.
Future absenteeism	Indicators of future short- or long-term absence from work, but not including being retired or placed on permanent disability, following the assessment of work ability at a previous time point.
Future disability status	Actual disability status following the assessment of work ability at a previous point in time.
Retirement	Actual retirement status at some point following a rating of work ability at a previous point in time.

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