The Nomological Network of Self-Efficacy

and Psychometric Properties of Its General and Specific Measures

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Dedication

To my parents. Without your unending love and support, none of this would be possible.

Abstract

Since its proposal in 1977, self-efficacy (SE) has been applied to almost every behavioral undertaking imaginable. Over 30,000 studies have been conducted on SE since its introduction in 1977, and even meta-analyses exist in abundance. Unfortunately, the self-efficacy literature tends to suffer from several common oversights: 1) neglecting measurement properties of self-efficacy scales; 2) inappropriate compartmentalization of self-efficacy by domain; and 3) inappropriate categorization of criteria/outcomes of interest. Accordingly, the goal of the present research was to address the criticisms raised above through meta-analyses of five distinct areas: 1) the reliability of scores from SE scales; 2) the convergence of SE scales within and across behavioral domains; 3) the potentially differential relationships between SE scales and personality traits; 4) the potentially differential correlations between SE scales and cognitive ability; and 5) the potentially differential correlations between SE scales and outcomes. General and specific SE scales were examined for potentially differing relationships with variables of interest. Scales of self-efficacy exceeded basic standards of internal consistency reliability (though these scales were most consistent when at least 5 – 8 items in length) and displayed strong relationships with one another, even at differing levels of specificity and across behavioral domains. Additionally, self-efficacy scales demonstrated similar patterns of relationships with personality across domains. While measures of self-efficacy displayed more variable patterns of relationships with specific criteria, most scales – even those not tailored for the specific criterion – still functioned as acceptable predictors of academic and organizational performance.

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The Nomological Network of Self-Efficacy and Psychometric Properties of Its General and Specific Measures

Children's literature found an unexpected treasure in 1930. Written and published by Arnold Munk, *The Little Engine that Could* told the tale of a dedicated steam engine whose working mantra has since become synonymous with motivation and a positive outlook: "I think I can. I think I can. I think I can." While *The Little Engine* was set to a highly specific task, the possibilities for such an adaptive mindset apply to more than steam engines and boxcars. Regardless of the job, the 'I think I can' attitude can pay striking dividends. The lesson for children was well received, and the book was a commercial success.

The Little Engine's tale was not based on any specific psychological principles that were scientifically validated at the time and thus the illustration featured did not stem from scientific rigor. It was not until several decades later (and two new editions of *The Little Engine that Could*) that psychologists began paying meaningful attention to this phenomenon. In 1977, Albert Bandura published an article detailing a method to treat ophidiophobia – the fear of snakes – in clinical populations. The study was auspiciously titled *Self-efficacy: Toward a Unifying Theory of Behavioral Change*. Like *The Little Engine*, self-efficacy was set to a highly specific task, but was quickly cast in far broader terms than clinical treatments. In the years following its proposal, self-efficacy has been applied to almost every behavioral undertaking imaginable. Whether the goal is scoring well on a mathematics test, interacting positively with others, or performing one's job

with distinction, self-efficacy – an individual's confidence regarding his or her capability to perform a given task – is an essential prerequisite for success.

Defining Self-Efficacy

Fortunately for researchers, self-efficacy (SE) has enjoyed a relatively consistent definition over its nearly thirty-five year lifespan (see Table 1). As with all constructs, however, there has been a certain degree of evolution over time. Beginning as a "conviction that one can successfully execute the behavior[s] required to produce the outcomes [of interest]" (Bandura, 1977, p. 193), self-efficacy has shifted to a judgment about an individual's capabilities (Bandura, 1980, 1982, 1984) to a judgment regarding individuals' abilities to control their lives by producing given attainments (Bandura, 1997). Following these amendments, which have moved SE towards increasing generality, other researchers have adopted definitions very similar (if not identical) to those proposed by Bandura. Accordingly, the construct of self-efficacy is fairly consistently defined at the construct level as well as the operational level.

Much of the consistency in SE definitions is admittedly due to Bandura's role as the primary (and often sole) researcher of the construct for over a decade. The shift from more specific to more general definitions also reflects the course of Bandura's career. Beginning with his clinical work in 1977, Bandura focused almost exclusively on the practical applications of self-efficacy. Examining the fearful behaviors of ophidiophobes, Bandura found that strengthening individuals' SE expectations (through a variety of sources) led to marked reductions in avoidant behavior (Bandura, 1977). In effect, self-efficacy became a means to a very specific end. As his research progressed, however,

Bandura began examining self-efficacy as a construct in its own right; ultimately leading to the grander Social Cognitive Theory of which self-efficacy is a part. By the 1990s, he (and others) recognized the motivational possibilities of SE, leading to its widespread use in industrial-organizational (I/O) psychology (e.g., Kanfer, 2005). Since then, self-efficacy has been successfully applied to various theories of motivation and self-regulation (Philips & Gully, 1997), and has been linked to individual differences in personality (Judge & Bono, 2001).

Relevance of Self-Efficacy

Given its definition and applications, it is hardly difficult to acknowledge the wide-ranging relevance of self-efficacy for both theory and practice across psychological sub-disciplines. In clinical psychology, few dispute the value of SE as both a predictor and mediator of success in the context of desensitization therapies (e.g., Bandura, 1977; Dollard & Miller, 1950) and other psychological treatments (e.g., Ghaderi & Rangiaah, 2011; Ramo, Myers, & Brown, 2010). In cognitive psychology, social learning researchers (e.g., Perry & Bussey, 1979; Perry, Perry, & Rasmussen, 1986) have demonstrated that individuals can learn from a number of sources, ranging from direct (i.e., personal) experiences to indirect or vicarious observation of these experiences (i.e., social modeling). Building upon these findings, Bandura shows that self-efficacy functions as an accurate predictor of later performance, *no matter how such efficacy was engendered*. This principle constitutes an essential element of Social Cognitive Theory, and further broadens the applications of social learning beyond purely behavioral mimicry (Bandura, 1989b).

In a related vein, industrial-organizational (I/O) psychology uses self-efficacy in both theory and practice, most notably within the context of goal-setting and other motivational theories (e.g., Kanfer, 2005). Specifically, self-efficacy is often viewed as a moderator of the goal discrepancy-goal pursuit relationship – such that low SE individuals get discouraged while high SE individuals persevere in the face of obstacles and adversity. Interestingly, these behavioral tendencies have also been used as stable individual differences, often within the context of Judge and colleagues' Core Self-Evaluations (e.g., Judge & Bono, 2001). Here, self-efficacy has been linked meaningfully to essential I/O constructs such as job satisfaction and job performance; elsewhere, SE has been used to predict training goals (e.g., Sitzmann & Ely, 2011).

The State of the SE Literature

As a consequence of its popularity and applicability, self-efficacy is one of the most broadly researched topics in modern psychology. Over 30,000 studies have been conducted on SE since its introduction in 1977, and even meta-analyses exist in abundance. As Tables 2 – 10 show, these meta-analyses range across a variety of topics. While medical, fitness, and nutritionally-oriented topics constitute a nontrivial proportion of the literature, there are still dozens of more psychologically-focused analyses as well. The following review is based largely on the meta-analytic relationships summarized in Tables 2-10.

A number of researchers have, unsurprisingly, examined self-efficacy in the context of psychological health, ranging from emotional exhaustion and depersonalization (Alarcon, Eschleman, & Bowling, 2009) to social acceptance (Bauer et

al., 2007) and general distress/post-traumatic stress disorder (Luszczynska, Benight, & Cieslak, 2009). Effect sizes vary widely among these analyses; from a mere .08 between unspecified SE and ego depletion to -.77 between trauma-specific SE and PTSD.

Turning to more I/O focused topics, SE (most often in its general form) relates modestly to work performance among previous meta-analyses. Uncorrected coefficients range from .16 to .38, with the two most recent analyses – Stajkovic and Luthans (1998) and Judge et al. (2007), respectively – displaying markedly different findings (r=.34 versus r=.16). [The difference is likely attributable to Stajkovic and Luthans focusing primarily on task performance, and Judge et al. combining measures of task performance with overall job performance, and other performance indicators and outcomes]. Several meta-analyses on non-performance work behaviors exist as well. Bauer et al. (2007) found a modest, negative relationship between job task/role SE and early turnover (r=-.16); Rauch and Frese (2007) discovered more robust relationships between generalized SE and both business creation (r=.33) and entrepreneurial success (r=.20).

Attitudinal variables such as work-family conflict, job satisfaction, and organizational commitment are also well represented in the meta-analytic literature on SE. Here self-efficacy displays – with few exceptions – its characteristically strong relationships, ranging from modest correlations with organizational commitment in new employees (r=.20; Bauer et al., 2007) and work-family conflict (r=-.24; Allen et al., 2012) to stronger relationships with job satisfaction in new employees (r=.28; Bauer et al., 2007) and employees in general (r=.38; Judge & Bono, 2001). Interestingly, non-work attitudes have also garnered sufficient attention for meta-analyses. Most notably,

exercise intentions and attitudes (Rodgers, Connor, & Murray, 2008), which demonstrate remarkably robust relationships with self-efficacy (r=.63 and r=.46, respectively).

In terms of motivational criteria, self-efficacy functions as a modest to exceptional predictor. Ranging from single digit correlations between SE and variables such as approach goal orientation (Payne, Youngcourt, & Beaubien, 2007), goal intention (Webb & Sheeran, 2008), and protection motivation (Floyd et al., 2000) to more substantial relationships between SE and learning goal orientation (r=.56; Payne, Youngcourt, & Beaubien, 2007), persistence (Sitzmann & Ely, 2011), and motivation (Sitzmann & Ely, 2011), self-efficacy demonstrates it affinity for goal-related behaviors.

Self-efficacy has also been investigated quite thoroughly in academic domains. While GPA and retention are common criteria of interest (e.g., Robbins et al, 2004), other researchers have examined both academic performance in its own right (Multon, Brown, & Lent, 1991) as well as reactions to training and instruction (Sitzmann et al., 2008). Correlations range from .05 to .59 in this domain, apparently depending upon the type of self-efficacy used in the analyses. Robbins et al. (2004) provide a telling comparison between academic SE and general self-concept (an evaluative construct somewhat related to SE): as expected, academic SE significantly outperforms general self-concept as a predictor of both GPA and academic retention.

Finally, self-efficacy has also been linked to various individual difference variables, ranging from the Five Factor Model of personality (Judge & Ilies, 2002) to vocational interests (Rottinghaus, Larson, & Borgen, 2003). As expected, correlations between SE and personality range between .09 (between SE motivation and

agreeableness; Judge & Ilies, 2002) and .73 (between math SE and mathematics interests; Rottinghaus, Larson, & Borgen, 2003). Overall, however, relationships between self-efficacy and stable individual differences are notably stronger than other variables, pointing to its trait sources.

In addition to sampling from a variety of criterion domains, previous meta-analyses have varied widely in the specificity or generality of their self-efficacy measures. Although many analyses favor using highly-specific scales that match a given criterion domain as closely as possible (e.g., Bauer et al., 2007; Beaudoin & Descrichard, 2011; Rottinghaus, Larson, & Borgen, 2003), several use more generalized measures of SE to predict outcomes of interest (e.g., Alarcon, Eschleman, & Bowling, 2009; Judge & Bono, 2001). Further complicating the issue, one major concern is that many of these meta-analyses may be mixing domain specific and general self-efficacy scales inappropriately in their analyses.

Is Synthesis Possible?

Across all its applications, one unambiguous theme emerges: self-efficacy as a seemingly universal precursor to specific behaviors. However, the sheer volume and variety of self-efficacy measures seem to make few other generalizations feasible. Ultimately, these meta-analyses raise several important questions: Is this literature summarized appropriately through meta-analysis? Is such a summary even possible?

Fortunately, the confusion engendered by previous meta-analyses appears to be quite correctable. While these analyses offer a great deal of specific information regarding self-efficacy and its outcomes, they tend to suffer from several common

oversights. Most notably, these meta-analyses tend to neglect the following areas: 1) measurement properties of self-efficacy scales; 2) inappropriate compartmentalization of self-efficacy by domain; and 3) inappropriate categorization of criteria/outcomes of interest. In short, while current meta-analyses do an admirable job of examining and quantifying specific SE-criterion relationships, they often fail to link self-efficacy to other variables in the larger nomological network. Accordingly, the goal of the present research was to address the criticisms raised above through meta-analyses of five distinct areas: 1) the reliability of scores from SE scales; 2) the convergence of SE scales within and across behavioral domains; 3) the potentially differential relationships between SE scales and personality traits; 4) the potentially differential correlations between SE scales and cognitive ability; and 5) the potentially differential correlations between SE scales and outcomes.

The Present Research

Reliability of SE Scale Scores

In many ways, test score reliability constitutes the foundation for all our measurable scientific progress in psychology. Defined most generally as the ratio of true score variance to observed score variance (Cronbach, 1947), test score reliability fulfills a variety of functions. It serves as a prerequisite for construct validity (Cronbach, 1951) and as a measure of the proportion of error variance in test scores (Nunnally, 1967). Reliability, whether as an index of scores' internal or temporal consistency, should be assessed for virtually all psychological measures.

While researchers (e.g., Cortina, 1993; Schmitt, 1996) have treated the various uses, importance, and limitations of reliability in no small detail, many of the most important lessons may have gone unrecognized among designers of SE scales. Accordingly, the self-efficacy literature currently consists of a relatively limited selection of sophisticated, well developed measures dwarfed by a significantly larger number of measures whose psychometric properties remain uninvestigated. In the absence of concrete data, it is possible that many, if not most, of the SE scales currently in use fail to meet minimum psychometric standards that allow us to evaluate their scores in a meaningful fashion – leading to considerable difficulties regarding interpretation at the construct level. Often, even studies that do address the reliability of a scale simply report an alpha coefficient and proceed without any greater attention to its implications.

Coefficient alpha is hardly the only reliability type of interest, however. Although estimates of internal consistency are necessary to determine the influence of random response and specific factor errors on scale scores – as well as the potential unidimensionality of the scores – they do little to address transient errors of measurement (i.e., errors that vary across measurement occasions but not within them; Schmidt & Hunter, 1999). Unfortunately, the theoretical definition of self-efficacy suggests that, by its very nature, the construct is not necessarily stable over long periods of time, due to its mutability by personal experience and vicarious learning (Bandura, 1997). Accordingly, very few studies attempt to capture data regarding potential transient errors. As a result, the current meta-analyses will examine only internal consistency (alpha) reliabilities across various broad domains of self-efficacy to answer the following questions:

1.1) How reliably is SE measured? What are the typical magnitudes of SE scale score internal consistency reliabilities?

1.2) Are there differences in measurement error associated with SE scores in various behavioral domains?

1.3) What are the consequences of these potential reliability differences at the item- and scale-level?

Convergence of SE across Domains

In addition to purely psychometric concerns, there is a lingering philosophical debate that informs much of the research on self-efficacy. In brief, this debate concerns the specificity and contextualization of self-efficacy and its consequent role in both scale development and SE research. According to Bandura (2006), "the efficacy belief system is not a global trait but a differentiated set of self-beliefs linked to distinct realms of functioning [emphasis added]… [t]here is no all-purpose measure of perceived self-efficacy. The *'one measure fits all'* [italics in original] approach usually has limited explanatory and predictive value because most of the items in an all-purpose test may have little or no relevance to the domain of functioning [emphasis added]." (p. 307).

Based on Bandura's conceptualization of the efficacy construct, this position makes a great deal of sense. Efficacy deals with individuals' beliefs regarding a concrete set of *behaviors*; as measures move away from these particular behaviors, prediction should become increasingly difficult. A similar argument has been made for measures of personality (Bandura, 1997): as researchers decontextualize a measure, the greater possibility for erroneous (or at least inconsistent) interpretation and – as a result –

reduced predictive validity. Taken to its logical extreme, a generalized self-efficacy measure should have virtually no predictive power: containing no specific behavioral information, such a measure would maximize the chances for individuals to interpret it incorrectly.

No matter how well justified on theoretical grounds, this position is often perceived as an article of faith rather than investigated as an empirically tested proposition. Although scales of generalized self-efficacy (GSE) have been in circulation since the early 1980s (e.g., Schwarzer & Jerusalem, 1995; Sherer et al., 1982), most researchers have simply sidestepped the issue and created their own contextualized, domain-specific measures as per Bandura's (2006) instructions. More recently, however, other researchers have begun exploring this issue empirically – and have found provocative results. Most notably, Judge and his colleagues (Judge & Bono, 2001) have used a general form of self-efficacy in their investigation of Core Self-Evaluations, a higher-order compound trait associated with a variety of organizationally relevant criteria.

Judge and Bono's (2001) meta-analysis demonstrates the predictive capabilities of generalized self-efficacy in its own right, but it too sidesteps the issue of domain-specificity and contextualization. Given GSE's correlations with other personality traits such as emotional stability and locus of control, it is possible that the general form of self-efficacy is an entirely different construct from its more specific counterparts. The current meta-analysis examines the degree to which scales of SE converge *across* distinct

behavioral domains, contrasting against the degree to which scales of SE converge *within* behavioral domains, answering the following questions:

2.1) Are there comparable levels of convergence of SE measures both within and across behavioral domains?

2.2) What are the magnitudes of the convergent validities for SE?

2.3) When corrected for unreliability of measurement is there evidence for isomorphism?

2.4) If so, does this occur within certain domains, or across all domains?

2.5) In contrast, are there particular domains that seem especially distinct?

SE-Personality Relationships

The concerns raised by the debate discussed above have construct-level implications beyond self-efficacy itself. In addition to understanding the structure and convergence of SE, researchers must understand the boundaries of the construct with respect to other individual difference variables. Historically, self-efficacy has been viewed as a collection of highly domain-specific, contextualized beliefs (Bandura, 1997) rather than as a single, relatively stable trait. As such, relationships between SE in a given domain and external constructs such as emotional stability could vary widely across behavioral contexts.

In fact, previous meta-analytic research gives reason to suspect that domain-specific SE scales may not be ideal or uniform indicators of personality, especially when compared to more general measures. Consider, for example, Judge et al.'s (2007) meta-analysis examining the construct-level relationships between the Five Factor Model of

personality and self-efficacy. Employing task- and job-specific SE measures, researchers found relatively modest overlap between efficacy and personality (ρ's from .11 to .35). However, more recent research suggests that potentially stronger relationships exist between these constructs at a more general level. Stewart et al. (2008) obtained construct-level estimates of nearly twice the magnitude of Judge et al. (2007) for conscientiousness, openness, and emotional stability (ρ's from .49 to .73) when using generalized self-efficacy; Strobel, Tumasjan, & Spörrle (2011) found relationships of similar magnitude.

Thus, if self-efficacy is better conceptualized as a more general and unitary construct (at least in part) then there is reason to believe that its relationships with other constructs are more stable across domains. In this case, we would expect similar patterns of relationships with personality, regardless of the domain. Using the Big Five model of personality as an organizing framework, the current meta-analyses examine the degree to which specific personality traits correlate with various domains of self-efficacy to answer the following questions:

3.1) Are there personality traits that relate consistently to self-efficacy across domains, or are there extreme differences within each domain?

3.2) What are the magnitudes of these SE-personality relationships?

3.3) Is there a relationship between SE and personality particularly strong for a single trait (or set of traits)?

3.4) Is there relationship between SE and personality particularly weak for a single trait (or set of traits)?

3.5) How do SE –personality relationships vary for different Big Five facets and compound traits examined?

SE-Cognitive Ability Relationships

Like personality, cognitive ability is viewed as a relatively stable individual difference variable that conforms to a well-known hierarchical structure (Ones, Viswesvaran, & Dilchert, 2005). As a result, much is known about its relationships with a variety of variables (e.g., *g* and job performance – Kuncel, Ones, & Sackett, 2010; Schmidt, 2002; *g* and life outcomes – Gottfredson, 1997). Despite this wealth of knowledge, few researchers have directly examined its relationship with self-efficacy. Part of this dearth of research comes from the proposed nature of self-efficacy – as a highly contextualized variable that does not function as a stable difference among individuals, there is little theoretical point in trying to identify correlations with cognitive ability. In essence, self-efficacy is too changeable both within individuals and across particular behavioral domains to maintain consistent relationships with *g*. Once again, this proposition has not been tested empirically.

In addition, there are compelling reasons to suspect meaningful and stable relationships between SE and cognitive ability no matter the underlying structure of self-efficacy. If SE can be viewed as a more general construct, then a similarly general cognitive ability construct (i.e., *g*) should be a relatively strong, stable predictor from the perspective of comparable levels-of-analysis (Cronbach & Gleser, 1965). On the other hand, if SE can only be discussed within the context of specific behavioral domains, then perhaps more specific cognitive abilities (i.e., mathematical ability; verbal ability) would

best serve. Furthermore, there should be notable differences in the degree to which specific cognitive abilities relate to specific self-efficacy domains.

While the discussion above presupposes significant and stable relationships between self-efficacy and cognitive ability, it is equally important to discover the magnitude of this relationship even if it is trivial. Given the definition of SE as a self-referential, cognitive phenomenon (e.g., Bandura, 1989b), this seems rather unlikely. If self-efficacy *is* largely unrelated to cognitive ability, however, we still gain valuable knowledge of the construct's boundaries. The current meta-analysis examines the degree to which general cognitive ability (and its traditional and nonverbal measures) correlates with various domains of self-efficacy, answering the following questions:

4.1) Does general cognitive ability relate consistently to self-efficacy across domains, or are there extreme differences within each domain?

4.2) What are the magnitudes of these SE-general cognitive ability relationships?

4.3) Is the relationship between SE and general cognitive ability particularly strong for a single behavioral domain?

SE-Outcome Relationships

Finally, research is surprisingly limited regarding the relationships between self-efficacy and criteria of interest. To be sure, there are hundreds – perhaps thousands – of studies examining SE and specific outcomes; most of the literature involves these individually-tailored links between a single form of self-efficacy and its complementary behavior. However, there have been relatively few attempts to synthesize this literature within behavioral domains – and almost no attempts to do so across SE domains.

Stajkovic and Luthans (1998) have conducted a meta-analysis examining specific SE's relationship with work-relevant outcomes. While the study boasts an impressive sample size (21,616 individuals across 114 studies) the analysis itself is somewhat lacking in a few critical respects of reporting. First, the distinctions among different performance criteria (e.g., task performance vs. contextual performance) are conspicuously absent. Stajkovic's dissertation on which the published article is based suggests that much, if not all performance criteria, may be described as task performance. Similarly, it is unclear which domains of SE (e.g., academic, social, and/or work) are represented within the analysis.

In addition to the combinatorial confusions described above, Stajkovic and Luthans explicitly avoided coding any studies employing a more general form of SE. While this strategy was perfectly congruent with theoretical perspectives of the time, there is reason to believe that significant, valid relationships exist between organizational outcomes of various types and more general measures of self-efficacy. More recently, Judge, Jackson, Shaw, Scott, and Rich (2007) updated Stajkovic and Luthans' (1998) analysis, almost doubling the number of studies under investigation and adding a host of new potential moderators. While this analysis increments Stajkovic and Luthans' study significantly in terms of data, it still neglects to examine potential differences across different behavioral domains. In addition, Judge et al. appeared to combine even more studies utilizing a more diverse set of organizational criteria. There was little attempt at sorting out potentially differential relationships with the variety of criteria included in the analyses. Overall, meta-analyses examining SE-work performance relationships appear to

be a victim of an oft-cited but rarely justifiable concern of modern meta-analysts: the inappropriate combination of disparate studies within a single meta-analysis (i.e., 'combining apples and oranges'/'great bouillabaisse' arguments; Ones, Viswesvaran, Schmidt, & Lykken, 1996).

Accordingly, the current study updates the Judge et al. (2007) analysis to examine the degree to which self-efficacy predicts various criteria, ranging from overall performance to more specific criteria of interest in greater detail. In particular, SE relations are examined for overall job performance (e.g., Judge, Thoresen, Pucik, & Welbourne, 1999), objective job performance indicators (e.g., Erez & Judge, 2001), organizational citizenship behaviors (e.g., Harrison, Chadwick, & Scales, 1996), and extrinsic career success (e.g., Foti & Hauenstein, 2007).

The following questions are investigated:

5.1) Does SE relate consistently to all organizational criteria of interest, or are there extreme differences across criteria?

5.2) Do all types of SE relate consistently to organizational criteria of interest, or are there extreme differences across SE domains?

5.3) Are there particular matches of SE domains and criteria that yield exceptionally strong relationships? If so, are these matches explainable through either Bandura's or Judge's philosophy of SE measurement?

Potential Moderators

Across all the proposed meta-analyses, I am most interested in the potential moderating effects of self-efficacy domain on the strength of SE-criterion relationships.

In particular, I wish to determine whether or not (or to what degree) SE domains must conform to criteria of interest in order to display meaningful relationships. In addition, I aimed to determine if the specificity of self-efficacy *within* a given behavioral domain makes an appreciable difference in the strength of relationships. One of the most pervasive difficulties associated with the collected self-efficacy literature is reconciling self-efficacy measures of different levels of specificity. Due to the often overwhelming influence of Bandura's opinion on the subject, most researchers have been reluctant to address the issue of varying levels of specificity directly. Those who agree with Bandura tend to create self-efficacy scales that are highly task-specific; those who disagree tend to create more generalized measures (e.g., Jerusalem & Schwarzer, 1986a; Sherer et al., 1982). However, there are also numerous studies whose measures fall somewhere in between. These scales – when they are not simply ignored entirely – are often placed in one category or another without much meaningful discussion regarding *why* they are of intermediate specificity. Given the potential consequences of using a general SE scale in place of a more specific one, a more systematic delineation of self-efficacy is needed. Table 11 displays a new, three-level classification system that differentiates among SE scales across both behavioral domains and levels of specificity.

At the broadest level of specificity, measures of self-efficacy assess either a given behavioral domain in its entirety or cover a number of theoretically distinct sub-domains. For example, a broad (i.e., general) scale of work-related self-efficacy could measure an undifferentiated form of 'job performance self-efficacy' (e.g., Saks, 1995; Schwoerer & May, 1996), a 'job-in-general' form of SE (e.g., Ford et al., 1993), or measure multiple

aspects of job performance SE (e.g., SE for customer service *and* SE for time management). At the meso level of specificity, measures of self-efficacy assess a portion of a behavioral domain that subsumes several more specific behaviors. In academic domains, a meso-specific self-efficacy scale would measure Quantitative/Mathematics SE, which would contain Algebraic SE, Geometric SE, and a host of other more specific behavioral domains. This meso level of specificity can be found in work-related domains as well, often appearing as some form of 'job task SE' (e.g., Leadership SE; Semadar et al., 2006). The most constrained level of specificity corresponds to Bandura's ideal scope for self-efficacy scales: measures limited to a single behavior (or set of linked behaviors) that can be differentiated easily from other, conceptually similar ones (e.g., Adaptive Performance SE; Pulakos et al., 2002; Telemarketing SE; Wolfe et al., 1998).

In practice, these levels of specificity are not distributed evenly across behavioral domains. For example, the general *behavioral domain* of self-efficacy, by its very definition, only contains self-efficacy measures of general *specificity* within its confines (to date no researcher has attempted to create a self-efficacy scale that is highly specific while simultaneously general in scope). In a somewhat similar vein, the number of meso-level social SE scales seems quite limited at present. While the social behavioral domain is not constrained by any theoretical limitations, it appears that most researchers take either a highly specific (e.g., Rehg et al., 2012) or a wholly general (e.g., Harrison, Chadwick, & Scales, 1996) approach.

In contrast to general and social measures, academic and work-related SE scales appear to run the gamut of specificity, ranging from ultra-specific measures of self-

efficacy to care for elderly patients in assisted living environments (e.g., Evers et al., 2001) to generalized, overall job performance SE (e.g., Ford et al., 1993). Ultimately, parsing these scales apart will allow researchers to examine the potential differences in predictive power that arise from differing levels of measurement specificity within given behavioral domains. The conceptual clarity offered by Table 11 is intended as a contribution to the literature that will guide future theoretical and empirical work as well as guide the present research.

Method

Meta-Analytic Methods

The studies included in each of the meta-analyses for this dissertation were read and coded (see below for specific information regarding each meta-analytic database). In addition to the correlations, the specific SE scales used, the reliabilities reported, and the sample characteristics (e.g., age, profession, gender) were coded where available. Psychometric meta-analysis (Hunter & Schmidt, 1990) was used to cumulate the results across studies and to establish the correlations of interest. In general, psychometric meta-analysis relies upon effect sizes from individual, statistically independent studies and aggregates them to estimate population-level relationships. Tables displaying meta-analytic information follow a set pattern of reporting conventions, where N corresponds to the total number of participants (across studies) in the analysis, k corresponds to the total number of independent studies/samples in the analysis, and r and SD_r correspond to the observed sample size-weighted average correlation across studies and its standard deviation, respectively. Similarly, ρ and SD_ρ correspond to the population-level estimate of the effect size and its standard deviation, respectively. These two are estimated unreliability corrected correlations and the associated true score standard deviations (i.e., stardard deviations corrected for variability due to statistical artifacts, including unreliability). To estimate the variability across individual studies (and the potential for generalization and the presence of moderator variables; Whitener, 199), *credibility intervals* are calculated using the corrected standard deviation, SD_ρ. These credibility intervals are notated CV, with appropriate upper and lower boundaries.

Since one of the primary strengths of psychometric meta-analysis is its ability to account and statistically correct for sampling error and research artifacts (see below), confidence intervals – based upon uncorrected, sample size-weighted mean effect sizes – were deemed inappropriate and unnecessary. Instead, evidence of nontrivial differences among effect sizes (e.g., effect sizes across different behavioral domains of SE) were evaluated using the credibility intervals, such that effect sizes with overlapping intervals were not considered distinguishable from one another. As far as interpreting single effects was concerned, the present analysis uses Cohen's (1992) general rules of thumb for interpreting the relative importance of effect sizes/correlations: 0.10 for small effects; 0.30 for medium effects; and 0.50 for large effects.

In addition to sampling error, corrections were made for unreliability in the measures. The robust, large-scale artifact distribution based upon the reliability generalization (see Table 12 below) was used to correct for unreliability in the self-efficacy measures, as the information was not available to correct each study individually. Overall, self-efficacy scale (internal consistency) reliabilities ranged from 0.84 to 0.91 across all behavioral domains. Moving beyond self-efficacy, artifact distributions were also employed to correct for unreliability in measures of personality, cognitive ability, academic performance, overall job performance, self-rated job performance, organizational citizenship behaviors, and both objective and adaptive performance measures. The distribution of personality scale reliabilities was drawn from Viswesvaran and Ones (2000), and ranged from 0.53 to 0.97 across all factors of personality. The distribution of cognitive ability scale reliabilities was drawn from

Kuncel, Hezlett, and Ones (2001), and was based upon a point estimate of 0.91 (from a composite of verbal, quantitative, and analytical intelligence measures). The distribution for overall job performance was drawn from Viswesvaran, Ones, & Schmidt (1996), and ranged from 0.36 to 0.67 for overall performance; artifact distributions for self-rated performance reliabilities were drawn from contributing studies, and ranged from 0.51 to .93. Due to the relatively small number of studies, distributions of reliability for academic performance, organizational citizenship behaviors, objective performance, and adaptive performance were drawn from studies included in the present analyses. Reliabilities ranged from 0.84 to 0.91 for academic performance; from 0.72 to 0.93 for organizational citizenship behaviors; and from 0.90 to 0.94 for objective performance. Adaptive performance, based on a single study, used a point estimate of 0.98 for its reliability. All reliabilities were estimates of internal consistency, although it is acknowledged that for some of these criteria inter-rater reliabilities would have been the appropriate indices to use in corrections. No corrections were made for range restriction, as these data were not available from the gathered studies.

Reliability Generalization Methods

Although modern meta-analysis is capable of cumulating many types of effect sizes across studies, it is somewhat ill-suited to estimating coefficient alpha/internal consistency and test-retest reliabilities on its own (Rodriguez & Maeda, 2006). Despite the proliferation of reliability generalization meta-analyses since the 1980s, these studies usually employ meta-analytic techniques which fail to account for the unique sampling distribution of reliabilities and neglect to weight individual studies by the precision of their estimate (Rodriguez & Maeda, 2006). Fortunately, recent work by Rodriguez and Maeda has offered a solution to this problem. By estimating a study's precision as a function of the number of items in the study's scale, the number of subjects, and the observed reliability of its scores, it is possible to transform reliabilities into a normalized distribution more amenable to standard meta-analytic techniques, leading to a more appropriate meta-analytic estimate of coefficient alpha – labeled ρ_{α}.

Reliability Database

Since some form of reliability should be reported for all scales of self-efficacy, studies were drawn from research examining SE in any form, regardless of the main focus of the study or the authors' criteria of interest. As a result, the search terms for the reliability generalization database were similarly broad: any studies containing the keywords *efficacy, self-efficacy, self efficacy,* and *SE* were considered. Due to the breadth of possible results (>90,000) using these search terms, however, several exclusionary criteria were used to narrow the results to a more manageable size (and a more focused set of behavioral domains). Specifically, the following content areas were excluded in

their entirety: a) computers, internet, and technology use; b) smoking, dieting, nutrition, and other health-related behaviors; c) exercise, sport, and recreational physical activities; and d) sexuality and parenting. More specifically, restricted keywords were *computer*, *smoking*, *exercise*, *physical activity*, *pregnancy*, *pregnant*, *maternal*, *sex*, *alcohol*, *HIV*, *AIDS*, *sport*, *internet*, and *nutrition*. Following these exclusions, the remaining domains of interest were compressed into four broad categories: 1) academic self-efficacy; 2) work-related self-efficacy; 3) social self-efficacy; and 4) general self-efficacy. Although scales within each domain share characteristics at the broadest level of content, they can differ enormously in their specifics. For example, SE scales treating graduate students' efficacy to perform scholarly research (Forester, Kahn, & Hesson-McInnis, 2004) and scales assessing undergraduates' beliefs in their ability to balance multiple aspects of their roles as college students (Quimby & O'Brien, 2004) are both classified as academic self-efficacy. Similarly, SE scales involving applicants' confidence in their job interviewing skills (Latham & Budworth, 2006) and scales measuring prospective teachers' confidence in their teaching abilities (de la Torre Cruz & Casanova Arias, 2007) are both considered within the domain of career self-efficacy. Only the social and general self-efficacy domains seem more homogenous with respect to their apparent specific content – likely due to their relative scarcity in the literature as compared to subject-specific SE scales.

The literature search was also restricted to published sources in the form of English-language journals. Additionally, studies whose samples included children (age 12 or less) or patients from clinical populations were excluded, as the population of

interest was composed of individuals most likely to constitute the normal, adult workforce. After removing these areas from consideration, there were approximately 9,000 potential articles of interest within the American Psychological Association's PsycINFO database addressing self-efficacy (using the keywords above) for the years 1977 to the present. The final database contained a total of 580 reliability coefficients from 566 studies, including 193,234 individuals.

Convergence Database

To identify potential articles which might include appropriate coefficients, a keyword search of the PsycINFO database was conducted for articles published between 1977 and the present (keywords were *self efficacy*, *self-efficacy*, *SE*, and *efficacy*). Due to the sheer number of results yielded by this search (> 13,000) several exclusionary criteria were imposed to better refine the search. Subsequent searches were limited to the domains of general-, social-, academic-, and work-related self-efficacy (see above). In order to maximize the search results within these domains, however, the search was restricted by culling domains rather than limiting the search at its outset (restricted keywords are *computer*, *smoking*, *exercise*, *physical activity*, *pregnancy*, *pregnant*, *maternal*, *sex*, *alcohol*, *HIV*, *AIDS*, *sport*, *internet*, and *nutrition*). While these restrictions appeared sufficient to remove articles treating vastly different self-efficacy domains from the ones under examination, the literature remained prohibitively large (> 9,000). Further limiting the search to English language articles studying human, non-disordered populations of legal working age (> 12 years) led to a more manageable 2,547 potential articles. Studies which contained sufficient information to identify two or more distinct

self-efficacy scales (rather than sub-scales) and to extract a correlation between them were initially included. The final database contained a total of 137 correlations from 78 studies, including 26,925 individuals.

Personality Database

Unlike the previous two analyses which were drawn from nearly identical databases, the SE-personality database required a rather different series of inclusionary and exclusionary criteria. To identify potential articles which might include appropriate coefficients treating the relationship between self-efficacy and personality, a keyword search of the PsycINFO database was conducted for articles published between 1977 and the present (keywords were *efficacy, self-efficacy, self efficacy, SE,* and *personality, NEO, NEO-PI-R, NEO-FFI, Big Five, Five Factor Model, personality traits*). Here, the interest was in correlations of self-efficacy (restrictions below) with established scales of personality (i.e., those conforming to the Big Five model of personality). For purposes of this analysis, studies containing single traits or full models of personality were both acceptable. Using the search terms above – as expected – the number of potential results (> 8,000) required the use of further exclusionary criteria. Subsequent searches were limited to the domains of general-, social-, academic-, and career-related self-efficacy (restricted keywords were *computer*, *smoking*, *exercise*, *physical activity*, *pregnancy*, *pregnant*, *maternal*, *sex*, *alcohol*, *HIV*, *AIDS*, *sport*, *internet*, and *nutrition*). Further limiting the search to English language articles studying human, non-disordered populations of legal working age (> 12 years) led to 1,295 potential articles. Where possible, references from existing meta-analyses were also searched to supplement the

fuller literature search. Studies which contained sufficient information to identify two or more distinct self-efficacy scales (rather than sub-scales) and to extract a correlation between them were initially included. The final database contained a total of 174 correlations from 52 studies, including 19,994 individuals.

Cognitive Ability Database

To identify potential articles which might include appropriate coefficients treating the relationship between self-efficacy and cognitive ability, a keyword search of the PsycINFO database was conducted for articles published between 1977 and the present (keywords were *efficacy*, *self-efficacy*, *self efficacy*, *SE*, and *intelligence, general intelligence, mental ability*, *general mental ability*, *cognitive ability*, *general cognitive ability,* and *g*). Here, the interest was in correlations of self-efficacy (restrictions below) with established measures of cognitive ability. For purposes of this analysis, studies using measures of either general or nonverbal cognitive abilities were both acceptable. Using the search terms above the number of potential results (> 4,500) required the use of further exclusionary criteria. Subsequent searches are limited to the domains of general-, social-, academic-, and career-related self-efficacy (restricted keywords were *computer*, *smoking*, *exercise*, *physical activity*, *pregnancy, pregnant*, *maternal*, *sex, alcohol*, *HIV*, *AIDS*, *sport, internet*, and *nutrition*). Further limiting the search to English language articles studying human, non-disordered populations of legal working age (> 12 years) led to 463 potential articles. Where possible, references from existing meta-analyses were also searched to supplement the fuller literature search. The final database contained a total of 41 correlations from 35 studies, including 9,929 individuals.

Criteria Database

To identify potential articles which might include appropriate coefficients treating the relationship between self-efficacy and various criteria of interest, a keyword search of the PsycINFO database was conducted for articles published between 1977 and the present (keywords were *efficacy, self-efficacy, self efficacy, SE,* and *job performance, academic performance, citizenship, organizational citizenship behavior,* and *OCB*). As the focus of the present dissertation was on overall measures of performance from field settings, studies examining task performance (and studies conducted in laboratory settings) were excluded from the database. Additionally, searches were limited to the domains of general-, social-, academic-, and career-related self-efficacy (restricted keywords are *computer*, *smoking*, *exercise*, *physical activity*, *pregnancy*, *pregnant*, *maternal*, *sex*, *alcohol*, *HIV*, *AIDS*, *sport*, *internet*, and *nutrition*). The search was further limited to English language articles studying human, non-disordered populations of legal working age (> 12 years). Where possible, references from existing meta-analyses were also searched to supplement the fuller literature search. The final database contained a total of 67 correlations from 55 studies, including 12,657 individuals.

Results

Self-Efficacy Reliability Generalization

Table 12 displays the meta-analytic results after applying Rodriguez and Maeda's (2006) transformations. Encouragingly, these precision-weighted averages (ρ_α) yielded surprisingly high and stable point estimates for the SE scores' reliability – well in excess of the generally accepted .80 standard – both within and across all domains. In addition, the low variances associated with the reliabilities allow for differentiation among scores across different content domains. Specifically, scores within the social and career domains demonstrated the greatest internal consistency, with scores of scales within the academic and general self-efficacy domains displaying lower (though still acceptable) reliabilities. As these results are derived from full scales, however, they are potentially misleading. Since scores from scales of differing lengths cannot be compared equitably without a common denominator, a more fundamental indicator is needed: estimated single-item reliability (i.e., mean inter-item correlation).

Table 12 also displays descriptive statistics of SE scales and number of items included. The number of items within each domain varied enormously. Most career and social SE scales contained 25 items; most general SE scales contained 10 items; and most academic SE scales contained only 5 items. Although the mean number of items may suggest that self-efficacy scales, regardless of content domain, generally maintain sufficient length for minimum reliability standards, this conclusion neglects the often impressive variability displayed among the SE scales. Academic SE scales ranged from 2 to 75 items (SD=13), work-related SE scales ranged from 2 to 190 items (SD=23), social

SE scales ranged from 2 to 40 (SD=11), and general SE scales ranged from 3 to 57 items (SD=7). With the exception of the general and social domains, the standard deviation of the number of scale items met or exceeded the average number of items, and the modal number of items was often much lower than the mean. While these means were surprisingly robust to outlier scales with large numbers of items, the fact that the current analysis failed to include single-item measures of self-efficacy suggests that these estimates may be overly optimistic.

Despite its psychometric importance, the length of a given scale serves only as a rough approximation of its scores' reliability. Fortunately, the Spearman-Brown prophecy formula can be used to more accurately assess and compare different domains using single-item reliability estimates. Findings are represented in Table 12. It appears that single-item reliabilities fell within a relatively narrow range. However, even among only four content domains there were distinguishable differences. Unsurprisingly, the general self-efficacy domain was least internally consistent, featuring items which were, on average, only modestly correlated with one another (r=.340). In contrast, the academic self-efficacy domain appeared to be somewhat more consistent (r=.437). The confidence intervals, however, showed that while the domains' point estimates display some differences, there was a fair amount of overlap. Single item indicators of SE correlate in the .34 – .44 range with other items. Focusing items on a single domain of behavior appears to somewhat improve the magnitude of this relationship.

While single-item reliabilities allow for easy comparisons among domains, they give little information about the predicted reliability of scores from a full scale composed

of similar items. As such, the Spearman-Brown prophecy formula is again needed to estimate the properties of scores from longer scales. Using the single-item reliabilities derived from the meta-analytic data, Table 13 displays the estimated full-scale reliabilities of scores from scales of comparable length. Based on these estimates, scales of academic self-efficacy required only five items to reach an internal consistency reliability of .80. However, scales sampling from the other content domains needed seven or eight items to reach the same standard. Thus, there are practical implications of the present set of findings for SE scale construction and use.

Self-Efficacy Convergent Validity Meta-Analyses

Table 14 displays the observed and corrected correlations among scales of *academic self-efficacy*. Among all of the comparisons, levels of convergence remained strongly positive, with observed correlations ranging from .44 to .50 and corrected correlations ranging from .52 to .59. The convergence among academic self-efficacy scales (r=.50; ρ=.59), perhaps surprisingly, was quite similar in magnitude to the convergence found between academic self-efficacy scales and measures from other behavioral domains. While second order sampling error may be a concern for the cross-domain convergence estimates, these results demonstrate the robustly positive relationships among both similar and disparate self-efficacy scales.

Table 15 displays the observed and corrected correlations among scales of *work-related self-efficacy*. Levels of convergence among all of the comparisons were once again strongly positive; rs ranged from .40 to .50, while ρs ranged from .48 to .59. The convergence was strongest among work-related self-efficacy scales (r=.50; ρ=.59),

though cross-domain comparisons yielded comparable levels of convergence. As with academic convergence, second order sampling error may account for differences among point estimates. However, the smallest analyses, examining the relationships between work-related SE and academic SE and social SE, respectively, yielded results congruent with their more robust counterparts.

Table 16 displays the observed and corrected correlations among scales of *general self-efficacy*. Unlike the previous analyses, there appeared to be larger differences between within- and cross-domain convergence estimates. In particular, the degree of convergence among general self-efficacy scales (r=.59; ρ=.71) was noticeably larger than those associated with cross-domain convergence (rs ranged from .40 to .48; ρs from .48 to .57). Despite these potential differences in magnitude, however, all correlations demonstrated the continuing trend of strong, positive relationships.

Table 17 displays the observed and corrected correlations among scales of *social self-efficacy*. Similar to the results of general self-efficacy described above, convergence among scales of social SE was slightly larger (r=.51; ρ=.59) than convergence across behavioral domains (rs ranged from .40 to .48; ρs ranged from .48 to .57). However, these potential differences in point estimates were less extreme than those associated with general self-efficacy. Additionally, scales of social self-efficacy were the least numerous in the literature, making second order sampling error a greater potential concern.

One important consideration is whether these results and conclusions need to be qualified based on the level of specificity of the measures. Using the conceptualization offered in Table 11, moderator analyses were conducted to examine the levels of

convergence among SE scales of each domain as a function of their specificity. These moderator analyses could only be conducted for academic and work domains due to the limited availability of data.

Table 18 displays the levels of convergence among scales of *academic self-efficacy as a function of their specificity*. Using the definitions from Table 11, there were a total of ten studies whose scales of academic SE fell within the same level of specificity; the other ten studies featured academic SE scales that differed in terms of their specificity level. While there were small differences in the magnitude of convergence between matched (r=.47; ρ=.55) and mismatched (r=.54; ρ=.63) scales, these differences were not only minor, but manifested in the opposite expected direction (i.e., the data favored greater convergence among mismatched scales).

Table 19 displays the levels of convergence among scales of *work-related self-efficacy as a function of their specificity*. Using the definitions from Table 11, there were a total of fifteen studies whose scales of work-related SE fell within the same level of specificity; the other sixteen studies featured work-related SE scales that differed in terms of their specificity level. Unlike the differences for academic self-efficacy, scales of work-related self-efficacy converged more noticeably for matched levels of specificity (r=.61; ρ=.72) than for mismatched levels (r=.40; ρ=.47). While second order sampling error is less of a concern for this analysis, SD_r and SD_ρ for matched and mismatched scales were sufficiently large to suggest a high degree of overlap.

Tables 20 and 21 provide an overview of all convergent validities examined in this dissertation. Integrating findings across these results, it is quite clear that SE scales

aiming to tap into different domains are highly correlated. In many cases, cross-domain relationships are almost as high as convergent validities within-domains. The large magnitudes of cross-domain convergent validities do not diminish markedly when SE scale is taken into account, as was done in the moderator analyses presented in Tables 18 and 19.

SE-Personality Meta-Analyses

In examining the relationships of SE with personality variables, I relied on the Big Five taxonomy of personality. Thus, for each domain's SE measures, relationships with neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness were examined. As far as specific measures of personality were concerned, the most common scales encountered in the present analyses were Costa and McCrae's (1985) NEO Personality Inventory (NEO-PI) and Costa and McCrae's (1992) NEO Five Factor Inventory (NEO-FFI). While other personality inventories were found in the literature, (e.g., Saucier's [1994) Mini-Markers), all of the studies featured in the present analysis contained personality factors analogous to those found in a five factor model.

Table 22 displays the correlations between ***neuroticism*** and self-efficacy by behavioral domain. As expected, neuroticism was strongly and negatively related to self-efficacy, regardless of domain. Despite this consistency, however, there were sizable mean differences in the magnitude of the negative relationship depending upon the specific domain. General SE and social SE displayed the most robust negative relationships (ρs of -.59 and -.52, respectively), whereas work-related SE and academic SE displayed more moderate relationships (ρs of -.40 and -.29, respectively). For

purposes of comparison, Table 22 also shows Judge and Ilies' (2002) estimate of the relationship between neuroticism and self-efficacy motivation. In contrast to the current analyses, Judge and Ilies' results are markedly smaller in magnitude (r=-.29; ρ=-.35).

Table 23 displays the correlations between *extraversion* and self-efficacy by behavioral domain. Across domains, extraversion was moderately and positively related to self-efficacy (rs ranged from .20 to .45; ρs ranged from .25 to .56). Similar to the results for neuroticism, the general and social domains demonstrated the strongest relationships with extraversion (ρs of .56 and .46, respectively). In contrast, the academic domain yielded a somewhat weaker relationship (ρ=.25). The difference between academic SE and the other behavioral domains should be interpreted with caution, however, as this analysis was based upon only two individual studies. Again, for purposes of comparison, Table 23 shows the appropriate coefficients from the Judge and Ilies (2002) analysis. As with neuroticism, Judge and Ilies' estimate is noticeably smaller and offers an underestimate of SE variables' relationship with extraversion.

Table 24 displays the correlations between *openness to experience* and self-efficacy by behavioral domain. Unlike the previous factors, openness to experience tended to yield more modestly positive correlations with less differentiation by behavioral domain. Although work-related self-efficacy appeared to display the weakest relationship with openness to experience, these differences should all be viewed with caution due to the size of SD_ρ across domains, as well as the small number of studies that contributed to several of the analyses. Interestingly, however, the Judge and Ilies (2002)

estimate of the relationship between openness to experience and self-efficacy motivation is still noticeably weaker (ρ=.20).

Table 25 displays the correlations between ***agreeableness*** and self-efficacy by behavioral domain. Here there were much more noticeable differences in both the strength and direction of relationships depending upon the given domain: academic and work-related self-efficacy each appeared to be modestly and positively related to agreeableness (ρs of .31 and .17, respectively), while general and social self-efficacy both seemed to be essentially unrelated to agreeableness (ρs of -.01 and .03, respectively). With the exception of work-related self-efficacy, however, there were relatively few studies available to examine these relationships. Accordingly, second order sampling error may be responsible for the more extreme differences found in the current data. Note that Judge and Ilies' (2002) point estimate of the SE-Openness relationship appears to be an underestimate for the academic and work-related domains.

Table 26 displays the correlations between ***conscientiousness*** and self-efficacy by behavioral domain. Similar to the results of the neuroticism and extraversion analyses, conscientiousness seemed to be more consistent in its pattern of relationships across various behavioral domains. Thus, general and academic self-efficacy displayed the strongest positive relationships with conscientiousness (ρs of .53 and .55, respectively), and work-related and social self-efficacy did not fall far behind (ρs of .43 and .41, respectively). For purposes of comparison, both the Judge and Ilies (2002) meta-analysis and a more recent study by Richardson et al. (2012) – focused on the academic domain – reported markedly weaker relationships between conscientiousness and self-efficacy. The

findings from this meta-analysis suggest that SE-conscientiousness relationships are in the .41-.53 range, depending on the domain and are not as moderate as those suggested by previous meta-analyses.

Unfortunately, relatively few studies examined specific personality facets in the context of self-efficacy. As a result, the current analyses only investigated the limited evidence treating the relationships between self-efficacy and both negative and positive affectivity in Tables 27 and 28, respectively. When measured as traits, negative affectivity is a facet of neuroticism and positive affect is a facet of extraversion. Information relating to negative affectivity and self-efficacy was only available from six studies; four investigating general SE and two investigating social SE. While the small number of studies raised the issue of second order sampling error, the specific results for general and social SE (ρs of -.48 and -.36, respectively) seemed congruent with the previous results for neuroticism (see above). Positive affectivity, in contrast, featured a few additional studies which allowed for comparisons to be made across all behavioral domains of interest (although second order sampling error remained a concern). Here, general self-efficacy displayed the strongest relationships with positive affectivity (ρ=65); the coefficients for the other domains, while still modestly positive, were noticeably weaker (ρs ranged from .21 to .53).

As was the case in analyses devoted to convergent validity, the level of specificity of SE measures could have a potential moderating influence on the findings. Fortunately, there were sufficient studies in this literature to examine potential level of specificity moderators for specific personality factor-SE domain relationships. Table 29 shows the

breakdown for differing levels of SE scale specificity for relationships between neuroticism and academic self-efficacy. Based on a limited number of studies, it appears that there may be a stronger relationship between neuroticism and academic self-efficacy when efficacy is measured with highly specific scales than with general ones (ρ=-.32 versus ρ=-.23). Due to the very limited number of more general scales to compare with, however, this finding is only preliminary. Table 30 displays the relationships between neuroticism and work-related self-efficacy for differing levels of specificity. In contrast to the results of neuroticism and academic self-efficacy, here it appears that more general measures of work-related SE yielded stronger relationships with neuroticism than highly specific measures (ρ=-.46 versus ρ=-.26). Table 31 displays the relationships between neuroticism and social self-efficacy for differing levels of specificity. While the overall number of studies available was quite limited (k=5), it appeared that general scales of social self-efficacy demonstrated stronger relationships with neuroticism than more specific scales (ρ=-.64 versus ρ=-.30).

Table 32 displays the relationships between extraversion and work-related self-efficacy for differing levels of specificity. While there were an adequate number of studies to examine these relationships at all levels of specificity, there were no significant differences. Table 33 shows the relationships between extraversion and social self-efficacy for differing levels of specificity. Similar the analysis for work-related self-efficacy, there were few noticeable differences that could be explained independent of second order sampling error.

Table 34 displays the relationships between openness to experience and academic self-efficacy for differing levels of specificity. While there were potential differences between highly-specific and general measures of academic self-efficacy, the large variances associated with these estimates suggest that these apparent differences may not be particularly large. Table 35 displays the relationships between openness to experience and work-related self-efficacy for differing levels of specificity. Similar to previous analyses, there did not seem to be much of a difference in the relationship between openness and work-related SE for highly-specific and general measures. However, work-related SE scales at the meso level of specificity appeared to have a stronger relationship with openness to experience. Unfortunately, there was only a single study in the meso-specific category, suggesting that second order sampling error may be responsible.

Table 36 shows the relationships between agreeableness and work-related self-efficacy at differing levels of specificity. Despite having only a single study at the meso level of specificity, a clear contrast emerged between highly-specific and general measures of work-related self-efficacy. Interestingly, it appeared that highly-specific measures (ρ=.31) demonstrated a much stronger relationship with agreeableness than general measures (ρ=.14).

Table 37 displays the relationships between conscientiousness and academic self-efficacy at differing levels of specificity. Similar to the analysis of agreeableness and work-related self-efficacy, there were few differences between levels of specificity that could not be accounted for due to the limited number of studies available for the moderator analysis. While there were potential differences between highly-specific and

meso-specific scales, the variance associated with the highly-specific estimate, coupled with the single study at the meso level of specificity, urge caution in interpretation. Table 38 displays the relationships between conscientiousness and work-related self-efficacy at differing levels of specificity. With larger sample sizes (and smaller variance estimates), it appeared that general measures of work-related self-efficacy were more strongly related to conscientiousness (ρ=.47) than their highly-specific counterparts (ρ=.38).

SE-Cognitive Ability Meta-Analyses

In examining the relationships of SE with cognitive ability, I relied on general indices of intelligence (versus more specific intelligence tests). As far as the identities of these intelligence measures were concerned, the most common scales encountered in the present analyses were the Wonderlic Personnel Inventory (Wonderlic & Associates, 1999), the Wechsler Adult Intelligence Scale-Revised (WAIS-R; Wechsler, 1981), and a composite of the quantitative and verbal scores of the SAT (formerly the Scholastic Aptitude Test; Donlon, 1984). Other measures such as Raven's Progressive Matrices (Arthur & Day, 1994) and the Multidimensional Aptitude Battery (Jackson, 1984a) were also included in the analyses, as well as several unnamed measures assessing general mental ability.

Table 39 displays the correlations between general self-efficacy and general mental ability. Contrary to expectations, the relationships found in the current analysis were much smaller than anticipated ($\rho s < .10$). However, it is worth noting that these relationships, while small, remained consistent for both general mental ability measures ($\rho=.08$) and their nonverbal counterparts ($\rho=.07$), and displayed little to no variation across studies. Turning to academic self-efficacy, Table 40 displays the relationships between the SE construct and general mental ability. Perhaps unsurprisingly, there was a much more robust relationship between constructs ($\rho=.22$). However, it appeared that highly-specific measures of academic self-efficacy were not as strongly related to general mental ability ($\rho=.18$) than either meso-specific ($\rho=.27$) or general ($\rho=.26$) alternatives. Interestingly, the relationship found in Table 41 between academic self-efficacy and

nonverbal general mental ability was markedly stronger (ρ=.35). However, the limited number of studies available for analysis necessitates cautious interpretation.

Finally, Table 42 displays the correlations between work-related self-efficacy and general mental ability. While these relationships were not as strongly positive (ρs ranging from .10 to .21) as those for academic self-efficacy and general mental ability, they were noticeably stronger than those for general self-efficacy. There seemed to be little difference in the effectiveness of highly-specific (ρ=.21) and general (ρ=.19) scales of work-related SE, yet meso-specific SE scales (ρ=.10) related significantly worse to measures of general mental ability. Again, however, there were relatively few studies available for analysis.

Overall, these trends suggest weak to moderate relationships between SE measures and general cognitive ability. Relationships appear to be weakest for general SE, and stronger in examined domains of self efficacy (academic, social, work related). Within each domain of SE, patterns of relationships were not generally stronger for highly specific SE measures of the domain versus more general measures of the same.

SE-Academic Performance Meta-Analysis

Table 43 displays the relationship between self-efficacy across various behavioral domains and academic performance. While previous meta-analyses of this relationship (e.g., Richardson et al., 2012) have found substantial relationships between academic SE and academic performance (ρ=.31) as well as performance SE and academic performance (ρ=.67), the current analysis focused on general SE and showed a much more modest relationship with academic performance (ρ=.20). While this correlation is certainly

weaker, it is by no means trivial, especially given the relatively small number of studies addressing the relationship. It appears that matching academic, but especially "academic performance" SE measures provide a better prediction of academic performance. Given that, earlier analyses reported in this dissertation indicated substantial overlap between general and academic SE measures, it is reasonable to expect that some, but not all, of the prediction of academic performance can be attributed to general SE (incremental validity analyses were not undertaken, due to the lack of data about the overlap between "academic performance" SE and both general and academic performance).

SE-Job Performance Meta-Analyses

Table 44 displays the relationship between *academic self-efficacy* and job and training performance measures. Unfortunately, studies examining this relationship were extremely limited; accordingly, unreliability corrected single studies are used in the comparisons. In the case of overall job performance (ρ=.33), Ackerman and Kanfer (1993) examined the potential of efficacy-based selection measures on air traffic controllers' performance in a field setting. For organizational citizenship behaviors (ρ=.35), Paglis, Green, and Bauer (2006) investigated the career commitment of doctoral students as a function of their self-efficacy as researchers. With respect to training performance (ρ=.40), Cannon-Bowers, Salas, Tannenbaum, and Mathieu (1995) determined the ability of Naval recruits' self-efficacy for accomplishing academic tasks to predict their ultimate performance during training. Table 45 shows the relationships between *social self-efficacy* and performance indicators. As with academic self-efficacy, there were very few studies addressing these relationships. In these individual studies, the

pattern of social SE-criterion relationships was less consistent. There was little to no relationship between social self-efficacy and organizational citizenship behaviors (ρ=.03) in Harrison, Chadwick, and Scales' (1996) investigation of American expatriates in Europe. However, based on Rehg, Gundlach, and Grigorian's (2012) study of cultural issues among government contracting trainees, social SE enjoyed a much stronger relationship with organizational tenure (ρ=.26).

Table 46 displays the relationships between *general self-efficacy* and various work criteria, including job performance. Like social self-efficacy, general SE demonstrated varied relationships with criteria. Strong relationships were found for citizenship behaviors (cf. Harrison, Chadwick, & Scales, 1996; ρ=.42) and objective outcomes of performance (e.g., length of unemployment among active job seekers; Eden & Aviram, 1993 ; ρ=.43). Measures of extrinsic career success (e.g., promotions among military cadets; Foti & Hauenstein, 2007) enjoyed a far weaker relationship (ρ=.11) with general SE.

Table 47 displays the relationships between *work-related self-efficacy* and overall job performance at different levels of specificity. Fortunately, a very clear picture emerged from differences at the highly-specific, meso-specific, and general levels: unambiguously, highly specific measures were more strongly linked to work-related self-efficacy (ρ=.44) than either meso-specific (ρ=.22) or general (ρ=.25) scales. Curiously, the current analysis of work-related self-efficacy's relationship with overall job performance yielded not only a lower estimate (ρ=.26) than the recent Judge et al. (2007) analysis (ρ=.37), but garnered only a fraction of the useable studies (ks of 24 and 217,

respectively). The results from this meta-analysis indicate that although highly specific measures of work-related SE can be strongly related to overall job performance, more general work-related SE measures have weaker relationships with the same criterion.

Table 48 displays the relationships *work-related self-efficacy* and self-rated job performance at different levels of specificity. Unlike overall job performance, there did not appear to be much differentiation between highly-specific (ρ=.33), meso-specific (ρ=.27) and general (ρ=.32) measures of work-related self-efficacy. Additionally, there seemed to be a great deal of variation within each level of specificity.

Table 49 displays the relationships between *work-related self-efficacy* and objective performance measures (e.g., quantity of sales) at varying levels of specificity. Here, it appeared that general measures of work-related self-efficacy were most strongly related to objective performance measures (ρ=.36); both highly-specific (ρ=.18) and meso-specific (ρ=.11) scales demonstrate considerably weaker relationships. The small numbers of studies contributing to each meta-analysis estimate leads to caution about these conclusions.

Finally, Table 50 displays the relationships between work-related self-efficacy and miscellaneous work criteria: absenteeism, adaptive performance, and extrinsic career success. While only modestly related to absenteeism (Schwoerer & May, 1996; ρ=-.12), work-related self-efficacy exhibited moderately strong relationships with both adaptive performance (ρ=.22) and measures of extrinsic career success such as salary and promotions (ρ=.20). Again, the availability of few studies on which these estimates are based make these point estimates tentative.

Discussion

This dissertation examined the psychometric properties and nomological network of self-efficacy measures. Distinctions were made regarding four types of SE measures by behavioral domain: SE measures assessing the construct in the academic domain, in the social domain, in the workplace, and general, decontextualized SE. A series of investigations were undertaken to examine each SE domain's measures' 1) internal consistency reliability (there were too few coefficients reported to examine temporal stability); 2) convergent validity (within and between domains); 3) relationships with the Big Five dimensions of personality as well as negative and positive affectivity; and 4) relationships with general cognitive ability (assessed using nonverbal and traditional measures). Relationships with academic and work criteria were undertaken to address shortcomings and gaps in their respective literatures. To that end, the relationship between general self efficacy and academic performance was examined and compared to previous meta-analytic estimates. Relationships with academic SE were also examined for work criteria, specifically overall job performance, OCB, and training performance. Relationships with general SE were cumulated for multiple work criteria as well (overall job performance, OCB, extrinsic career success, and objective performance outcomes). Work-related SE's relationships were examined for: 1) overall job performance; 2) self rated job performance; 3) objective performance indicators; 4) absenteeism; 5) adaptive performance; and 6) extrinsic career success. In addition to domain specificity, the potential moderating influences of scale specificity on results were investigated wherever possible.

Reliability Generalization

The present study was conducted to address the psychometric suitability of scales of self-efficacy across several broad content domains. Based on those studies included in this analysis, most published, multiple item SE scales yielded scores which can be considered at least adequately reliable. The fact that most of these scores display reliabilities in excess of .80, regardless of domain, suggests that their scales: a) are sufficiently stable and repeatable (e.g. individuals are performing consistently across items on the scale); and b) are assessing a common construct core (though not necessarily the *same* unidimensional construct).

Similarly, the Spearman-Brown derived single-item reliabilities allowed for the comparison of the overall cohesion of the different self-efficacy domains. Thus, academic self-efficacy appears to be the most tightly focused of the domains whereas general self-efficacy remains the least consistent of the efficacy constructs. The fact that general self-efficacy has lower internal consistency reliability than other types of self-efficacy is not surprising, since by some definitions general self-efficacy is simply an amalgam of several domains rather than its own, independent construct (Bandura, 2006). However, this argument is somewhat specious given that the general SE domain still displays an acceptable level of internal consistency; merely a bit less so than the other domains – a finding at odds with Bandura's (2006) position.

Unlike the overall meta-analytic results and the single-item reliabilities, the predicted reliability estimates from Table 13 allow for a variety of comparisons, including between scales of different domains as well as among scales within the same

behavioral domain. Most importantly, these predictions illustrate the potentially substantial differences in reliability for scores from shorter scales. As an example, consider the difference between a five-item general SE scale and a five-item academic SE scale. Based on the meta-analytic results above, the difference in reliability between scores from these two scales could be as much as .08. Furthermore, these differences do not disappear entirely until scales reach lengths unreasonable for research purposes (i.e., > 50 items). Accordingly, it is distressing to note that scales of general self-efficacy tend to be the shortest among the domains. These findings suggest that, in light of their lower internal consistency, such scales should be the longest in order to achieve acceptable levels of internal consistency. The progression of these estimated reliabilities also has a practical implication: given that SE scales do not reach acceptable levels until they possess at least five items, single-item measures rarely capture sufficient information to describe the self-efficacy construct reliably. As a result, researchers must acknowledge the dilemma posed by time and space constraints in a measure. From a psychometric standpoint it may be more prudent to refrain entirely from measuring self-efficacy if a scale of adequate length cannot be employed rather than to rely on a single item indicator.

Convergent Validity Meta-Analyses

The current study was conducted to determine the degree of convergence among scales of self-efficacy, both within and across behavioral domains. Tables 20 and 21 briefly summarize the results of the convergent validity meta-analyses. Looking at these results as a whole, the positive manifold among all scales of self-efficacy – regardless of domain – is extremely apparent. Observed estimates of convergence all lie above .40, and

once corrected for unreliability of measurement and sampling error, certain population level estimates rise as a high as .71. While specific point estimates may vary as a function of second order sampling error and large estimates of SD_ρ, it is abundantly clear that the levels of convergence among seemingly disparate behavioral domains are not trivial in magnitude. In many cases, the degree of convergence *across* behavioral domains rivals the degree of convergence *within* behavioral domains.

Interestingly, the magnitudes of these convergence estimates appear remarkably similar across various domain comparisons. While variances range from negligible (e.g., General-Social SE comparisons) to large (e.g., General-Academic SE comparisons), the majority of point estimates associated with cross-domain convergence fall within .10 of one another. Similarly, the range of within-domain convergence estimates runs from ρ=.58 (Academic-Academic SE comparisons) to ρ=.71 (General-General SE comparisons). Furthermore, if general self-efficacy is set aside, the within-domain convergence estimates are nearly identical ($\rho \approx .59$).

Whether or not these results indicate isomorphism remains an open question. While the coefficients are high when examined on an individual level, few are of such magnitude to suggest that all (or even most) of the variance for a given SE domain is explainable vis-à-vis a different SE domain. Taken collectively, however, these results provide evidence that Bandura's (2006) claim of extensive domain independence is at least somewhat exaggerated. Even specific domains such as work-related self-efficacy display remarkably robust relationships both with other specific domains (e.g., academic

SE) and general self-efficacy. Based on the current meta-analysis, no domain under investigation appears particularly independent or distinct.

In fact, the levels of convergence displayed by general self-efficacy warrant special mention. In particular, the degree of overlap between specific behavioral SE domains and general self-efficacy cannot be explained fully from Bandura's philosophical position of domain specificity and independence. If this were the case, GSE's lack of specificity should leave only tenuous relationships with specific behavioral domains. Instead, general self-efficacy is strongly and consistently related to all other domains – and by extension, specific behaviors – examined in the present study.

Additionally, if self-efficacy were constituted of largely independent and highly specific behavioral domains, other convergence estimates should be uniformly lower than those found in the present analysis. In the case of cross-domain comparisons, the differences in specific behaviors comprising different domains ought to preclude such a high degree of convergence. In the case of within-domain comparisons, differences in specific scales (e.g., mathematics SE and English SE) might also serve to lower the overall levels of convergence. At the very least, there should be much larger differences in levels of convergence between within-domain and cross-domain comparisons. In contrast to these theoretical justifications and predictions, there remains a considerable degree of overlap among scales whose specific domains seem to bear little theoretical resemblance to one another. Empirically speaking, however, there appears to be a remarkable degree of convergence among specific behavioral domains such as social and academic self-efficacy.

The picture becomes a bit less clear once levels of specificity are considered, however. For the two domains that contained SE scales at differing levels of specificity – academic SE and work-related SE, respectively – small to moderate differences in convergence were discovered. For academic self-efficacy, however, this difference appears to favor higher convergence among scales at differing levels of specificity. In contrast, work-related self-efficacy seems to follow a more intuitive pattern with respect to levels of specificity. In support of Bandura's arguments towards specificity, work-related self-efficacy scales display higher convergence at comparable levels of specificity. Given the breadth of scales that composed this behavioral domain, this finding is not particularly surprising. Since work-related SE scales in the present analysis ranged from nursing and career decision-making self-efficacy to job search and decontextualized job performance self-efficacy, similar levels of specificity among scales likely heralded similar behaviors as well.

In addition to the ambiguous results from the moderator analysis above, the present study is not without more substantive limitations. Cross-domain convergence estimates may be affected by second-order sampling error. Accordingly, both the point estimates and credibility values might shift with the addition of more data. However, the consistency among convergence estimates suggests that such changes would be relatively minor, leaving the pattern of results largely unchanged. Furthermore, the present study only examined the potential relationships between scales of self-efficacy at the aggregate level. Due to the often limited number of studies, convergence estimates for specific self-efficacy scales were not available. Finally, the current analyses were restricted to the

convergence among scales of self-efficacy without reference to a criterion. As such, these findings do not constitute conclusive evidence for the potential interchangeability of various self-efficacy scales for purposes of prediction. However, the present study does raise the potential that similar SE-criterion relationships may be found across different behavioral domains.

SE-Personality Meta-Analyses

The current study was conducted to determine the relationships between the Big Five model of personality and self-efficacy across a variety of behavioral domains. At the factor level, these results paint an impressively consistent picture (see Figure 1). For neuroticism, extraversion, openness to experience, and conscientiousness, all SE-personality relationships were remarkably similar in both strength and direction across behavioral domains. While there was some variability in the magnitude of these relationships (seeming to favor stronger relationships with more general behavioral domains), the overall pattern was neither inconsistent nor unexpected. Additionally, the current estimates for all five factors' relationships with self-efficacy appear to improve upon Judge and Ilies' (2002) estimates considerably. With one exception (see below), Judge and Ilies seemed to underestimate the magnitude of self-efficacy's relationship with personality by a noticeable margin.

In contrast, agreeableness appears to be the odd factor out in the present analysis. Unlike the other four factors, there were marked differences in both the strength and direction of the SE-agreeableness relationship by behavioral domain. It seems that general SE and social SE offered the smallest relationships, while academic and work-

related self-efficacy displayed more meaningful correlations. For academic self-efficacy these results might have been the result of second-order sampling error. Work-related self-efficacy, on the other hand, appears to be quite similar in magnitude to Judge and Ilies' (2002) estimate. Thus, it seems that agreeableness is the factor least related to self-efficacy, regardless of behavioral domain, and that even when examined in the context of a specific domain such as work-related SE, the relationship remains quite modest.

At the factor level of analysis, then, there is a notably consistent profile that seems to define self-efficacy across behavioral domains. The prototypical highly efficacious individual is low in neuroticism (or high in emotional stability), high in extraversion, high in openness to experience, and high in conscientiousness. Of these factors, neuroticism, extraversion, and conscientiousness seem to be most important – a finding in keeping with previous meta-analyses on personality and self-efficacy (e.g., Judge & Ilies, 2002). As far as theoretical justifications for this pattern of results are concerned, it would seem that neuroticism and conscientiousness, long known to be powerful predictors of work-related performance (Barrick, Mount, & Judge, 2001; Hurtz & Donovan, 2000; Salgado, 1997) may also generalize to performance in other domains of functioning. Turning to extraversion, it is possible that the positive emotionality aspect of the construct affects individuals' confidence in their abilities to perform in a variety of behavioral contexts (Judge & Ilies, 2002). Certainly the present results regarding positive affectivity support this position. Openness to experience, while not quite as strongly related to self-efficacy across domains as neuroticism, extraversion, or conscientiousness, may operate upon self-efficacy through individuals' curiosity – either by overcoming

initial efficacy-related doubts regarding new experiences, or simply by providing open individuals with a greater repertoire of potentially related experiences which can be used as a basis for more positive self-efficacy evaluations.

Moving to a broader level of analysis, these findings indicate that self-efficacy may have an affinity for Digman's (1997) higher-order factors α (socialization; a compound of neuroticism/emotional stability, agreeableness, and conscientiousness) and β (personal growth; a compound of extraversion and openness to experience). With the potential exception of agreeableness, all of the Big Five are represented in congruence with Digman's (1997) model. Perhaps more provocatively, the present factor level results suggest a variety of subordinate compound traits to pursue to better define the self-efficacy construct, including optimism (a compound trait combining extraversion and emotional stability), self-control (a compound trait combining emotional stability and conscientiousness), and ambition (e a compound trait combining extraversion and conscientiousness) and intraception (a compound trait combining emotional stability and openness to experience; Hough & Ones, 2001). Furthermore, the subordinate facets of the Big Five themselves remain open as sources of interpretation and further analysis. Facets such as self-esteem and lack of anxiety (neuroticism/emotional stability), dominance and energy/activity level (extraversion), preference for change and curiosity (openness to experience), and achievement, order, and persistence (conscientiousness) remain open avenues of inquiry (Hough & Ones, 2001). Recent large scale meta-analyses, examining the lower level factor structure of extraversion (Davies, 2012) and emotional stability (Birkland, Connelly, Ones, & Davies, under review) are valuable in this connection.

Unfortunately, no clear winner emerges as the ideal level of specificity to assess personality across multiple behavioral domains of self-efficacy. In a few cases, highly-specific scales appear to be the best indicators; in many more, general scales seem to be most effective. In others, there were no clear or significant differences. In short, the current literature is insufficient upon which to draw substantive conclusions. However, given the pattern of results (albeit based on relatively few studies), it would appear that in many cases the level of specificity is either irrelevant or of only minor concern when examining self efficacy's relationships with personality variables.

Ultimately, the present study provides an unparalleled look into the basis of personality in self-efficacy across multiple domains. Whereas Judge and Ilies (2002) examined a single, relatively narrow domain of self-efficacy – self-efficacy motivation as assessed by confidence to perform on the job – the present analysis not only updates Judge and Ilies' findings by adding new articles, but also allows for cross-domain comparisons. Encouragingly, there were few major differences between the pattern of Judge and Ilies' (2002) results and the present work-related SE findings. While the present coefficients are uniformly greater in magnitude, this is likely a function of an expanded search within the domain of work-related self-efficacy.

As far as Bandura's position regarding self-efficacy and personality is concerned, consider the following perspective from Bandura (1999) himself, "it is unrealistic to expect personality measures cast in nonconditional generalities to shed much light on the contribution of personal factors to psychosocial functioning in different task domains under diverse circumstances across all situations" (p. 160). In startling contrast to the

sentiment described above, the present study offers substantial counterevidence that decontextualized personality measures do, in fact, contribute significantly to self-efficacy in different task domains. While the current evidence does not preclude certain efficacy domains from displaying wildly different patterns of association with personality, the four domains under investigation – and perhaps others – demonstrate remarkable consistency.

SE-Cognitive Ability Meta-Analyses

The current study aimed to determine the relationships between general cognitive ability and self-efficacy across a variety of behavioral domains. Contrary to expectations born of bandwidth-fidelity concerns (e.g., Cronbach & Gleser, 1965), generalized self-efficacy was only minimally related to the cognitive ability measures under investigation (both general measures and their nonverbal counterparts). Given that more specific types of self-efficacy (both academic and work-related) demonstrated far stronger relationships with general cognitive ability, it seems that the SE-cognitive ability relationship diminishes beyond a certain level of decontextualization. On purely theoretical grounds it is certainly not surprising that academic self-efficacy displayed the largest relationship to general cognitive ability in all its forms; likewise, previous meta-analyses of work-related self-efficacy and cognitive ability have yielded very similar estimates of the relationship's magnitude (e.g., Chen, Casper, & Cortina, 2001). However, it is important to stress that a small relationship, if consistent, is not necessarily trivial or unimportant. While the overall relationship between GSE and general cognitive ability, even when corrected for unreliability of measurement, remained quite small, variance estimates were

likewise minimal. Accordingly, there appears to be at least some cognitive component to the generalized (i.e., decontextualized) self-efficacy construct that cannot be accounted for solely by content overlap (as may be the case for academic self-efficacy and cognitive ability measures).

Moving beyond the unexpected finding with general self-efficacy, however, it is worth noting that there were relatively few significant differences among SE scales within a contextualized domain based on the scales' level of specificity. In other words, if a measure of self-efficacy were properly anchored in a given behavioral domain, the relative specificity or generality seemed not to matter. Unfortunately, the number of studies available to examine these relationships was far more limited than expected, especially given previous meta-analytic investigations of this topic. Consequently, there is presently no firm boundary that seems to delineate when a self-efficacy measure's relationship with general cognitive ability begins to diminish due to issues of over-generality. Given the small number of studies available, it is also inappropriate to generalize these results to other behavioral domains. Until this relationship can be investigated further, relationships between general cognitive ability and self-efficacy must be evaluated on a domain-by-domain basis.

Finally, the present analyses shed little light on the relationships between self-efficacy and more specific cognitive abilities. Given the weak relationship between GSE and *g*, there is little reason to suspect a stronger relationship between general self-efficacy and specific cognitive abilities. However, this relationship should be examined empirically rather than simply taken on faith. In a similar vein, future analyses should

determine to what degree, if any, the SE-cognitive ability is strengthened by complete congruence between cognitive ability and self-efficacy (e.g., verbal self-efficacy with verbal ability). As most studies employing more ad hoc measures of self-efficacy intentionally tailor their scales to specific criteria of interest, finding appropriate literature should not be difficult. More importantly, future research should determine the boundaries of this congruence (e.g., is the relationship between verbal SE and verbal ability comparable to the relationship between English SE – a more specific domain – and verbal ability?).

SE-Academic Performance Meta-Analysis

The current study also examined the relationship between general self-efficacy and academic performance. Given the recent and very comprehensive meta-analysis by Richardson et al. (2012) on the relationships between academic self-efficacy and academic performance, the present analysis was conducted to fill one of the remaining gaps in the literature. Perhaps unsurprisingly, there were very few studies examining academic performance and general self-efficacy – certainly as compared to the dozens of studies examining academic SE and academic performance. However, comparisons among the coefficients from Richardson et al. (2012) and the present study reveal an interesting – albeit indirect – trend regarding the relative predictive power of highly specific scales of self-efficacy.

While general self-efficacy from the current analysis displayed the weakest relationship to academic performance (ρ=.21), Richardson et al. found progressively stronger relationships for academic (ρ=.31) and performance (ρ=.67) self-efficacy,

respectively. At first, the dramatic difference in coefficients may seem to be attributable to second order sampling error. However, the relatively small variances associated with Richardson et al.'s estimates belie this theory (at least for academic SE). Instead, it appears that the relationship between self-efficacy and academic performance strengthens as self-efficacy scales become more specific. General self-efficacy – a fully decontextualized measure – is only modestly related to academic performance; academic self-efficacy – a contextualized but still general measure (i.e., a meso-level scale) – is more strongly related to academic performance; and performance self-efficacy – a highly specific measure of academic performance self-efficacy – is very strongly related to academic performance. While the number of highly specific scales in the Richardson et al. (2012) meta-analysis is quite limited, the direction of the trend is clear.

In keeping with Bandura's (2006) philosophy of SE measure design, it appears that self-efficacy is most predictive of academic criteria when its scales are highly specific and closely tailored to the criterion of interest. As such, it seems that bandwidth-fidelity issues (cf. Cronbach & Gleser, 1965) are of significant importance for predicting academic outcomes. Furthermore, these findings are borne out in meta-analyses beyond Richardson et al. (2012) and the present study. Robbins et al. (2004), in their examination of the effects of various study skills – including academic self-efficacy – on academic performance and retention found a similar pattern of results for academic self-efficacy and general self-concept (a related but more general self-evaluative construct). Relationships with both academic criteria were an order of magnitude greater for the

specific form of self-efficacy (ρs of .36 and .50 for academic retention and GPA, respectively).

While this trend towards better prediction with greater SE specificity is clear across multiple meta-analyses, it is important to note that the current estimates for the GSE-academic performance relationship are far from trivial. Although not the ideal measures of performance in this context, general self-efficacy still maintains a robust relationship with academic criteria. To better delineate these relationships, future research should investigate the effectiveness of highly specific SE scales in other, non-academic contexts. Determining the boundary conditions of highly specific scales' prediction and adding more viable primary studies to the literature will aid both researchers and practitioners alike.

SE-Job Performance Meta-Analyses

The current study was conducted to determine the relationship between self-efficacy and job performance not only across a variety of behavioral domains but also across a selection of organizationally relevant criteria. Before examining the relationships between work-related SE and these criteria, it is interesting to note that the other domains of self-efficacy, including both unrelated specific domains (e.g., academic and social self-efficacy) and general self-efficacy, all demonstrated nontrivial relationships with various work-related criteria (including overall job performance). Although these non-work-related domains rarely yielded relationships of similar strength to their work-related counterparts, these correlations are hardly inconsequential. Given the small sample sizes for these analyses, caution is needed in interpretation. However, if additional studies can

demonstrate comparable patterns of association, then there may be some merit in using scales of self-efficacy from other domains to predict organizational outcomes. From both a research and practice standpoint, this is a very convenient circumstance; in the best case scenario, it frees both researchers and practitioners from creating additional, custom-tailored self-efficacy scales simply to match multiple criteria. While scales from other domains may not function optimally, they may open survey space for researchers and conserve time for test-taking employees – both valuable commodities.

Relationships between general self-efficacy and organizational criteria are of particular interest, especially in light of the recent meta-analyses by both Stajkovic and Luthans (1998) and Judge et al. (2007). Whereas these previous meta-analyses examined self-efficacy and job performance using only specific, work-related measures of self-efficacy, the present research not only adds new data on the predictive power of general self-efficacy but also allows for a breakdown of various organizational criteria. As compared to work-related scales of self-efficacy, there are relatively few relevant studies examining organizationally relevant criteria with general self-efficacy. Additionally, the relationships between general self-efficacy and various types of job performance were noticeably weaker. Similar to findings with academic performance, this seems to be a function of the bandwidth-fidelity problem (Cronbach & Gleser, 1965). Overall job performance, while seemingly more general than other performance measures such as quantity of sales or promotions, may nevertheless represent a fairly specific constellation of work-related behaviors. Accordingly, decontextualized self-efficacy might not be ideally suited to capturing it (as compared to more focused work-related self-efficacy

scales). Alternatively (and perhaps more likely), these results may simply be due to second-order sampling error.

More specific measures of performance such as organizational citizenship behaviors display stronger relationships with general self-efficacy. However, these results should be interpreted with extreme caution. While variances remain remarkably small for GSE's relationship with OCBs and objective performance criteria, these estimates are still based on a limited number of studies with fewer than 650 individuals (in the case of objective performance measures, fewer than 200). Thus, while the present results are both provocative and counterintuitive, it is quite likely that they emerge from second order sampling error.

Although the relationships between organizational criteria and general self-efficacy are interesting from a philosophical standpoint and appear surprisingly robust, it is not surprising that the strongest, most stable relationships are found between work-related self-efficacy and work-related criteria. Overall job performance, for example, is demonstrably stronger when assessed with work-related SE (ρ=.26) than with general self-efficacy (ρ=.16). Furthermore, there is a fairly clear trend favoring increased specificity as a predictor of overall job performance. As predicted by Bandura (and consistent with previous results for academic performance), highly specific SE scales displayed the most powerful relationships with job performance. In addition, the relationship found between highly specific work-related SE scales and overall job performance exceeded the most recent estimate from Judge et al. (2007). While Judge et al. used many more studies in their analyses, they also collapsed across varying levels of

specificity as well as variety of performance criteria. Consequently, a similar breakdown of the Judge et al. data might yield similar results.

The level of specificity information was only available for self-rated performance and objective performance and investigated as potential moderator of relationships with these criteria. Due to the similarity of rating one's capability to perform followed by rating one's actual performance, it is unsurprising that self-rated performance was generally more strongly correlated with work-related self-efficacy than overall job performance. Despite high point estimates, however, the variances associated with SE and self-rated performance were high enough to suggest that other moderators are at work. Additionally, there were few, if any, significant differences in the performance-SE relationship at varying levels of specificity. One possibility for these findings is that individuals rating both their capabilities to perform and their subsequent performance are simply filling in specific performance capability details that are absent from the more general SE measures. In essence, individuals are assuming more specificity on work-related SE scales than actually exists in the measures themselves. Unfortunately, given both the limited number of studies available for these analyses and the lack of item level information from all of the appropriate studies, such explanations remain speculative.

In summary, self-efficacy tends to display positive, meaningful relationships with a variety of organizational criteria beyond overall job performance across a number of behavioral domains and levels of specificity. Despite the magnitude of many of these relationships there are a few noteworthy exceptions: social self-efficacy and organizational citizenship behaviors; general self-efficacy and overall job performance;

and work-related self-efficacy and absenteeism. Most of these exceptions, however, may be due more to a limited pool of appropriate studies than real, construct level differences. At the moment it appears that work-related self-efficacy remains the most powerful predictor of work-related behaviors, and that greater specificity in the SE measure yields stronger relationships.

General Discussion

The Nomological Net of Self-Efficacy

The present series of meta-analyses have examined the nomological net of self-efficacy through a number of essential features of the construct: 1) the psychometric properties of self-efficacy scales; 2) relationships between and among self-efficacy scales; 3) relationships between self-efficacy and personality; 4) relationships between self-efficacy and general cognitive ability; 5) relationships between self-efficacy and academic performance; and 6) relationships between self-efficacy and job performance. Looking at these analyses as a whole, there is a wealth of information about the self-efficacy construct. In brief, its scales conform to basic psychometric standards (though there are some differences depending on the behavioral domain in question); the scales themselves are highly correlated with one another (regardless of the behavioral domain); it exhibits strong, consistent relationships with four of the five factors of personality (regardless of the behavioral domain); it displays strong relationships with academic performance (though highly specific, tailored SE scales do better than more general, decontextualized ones); and it displays generally strong (though more variable)

relationships with a variety of organizational criteria (but specific, work-related SE scales perform better than more general domains).

While Bandura's (1996) basic definition of self-efficacy remains accurate, the weight of over three decades of supplementary theorizing based upon primary studies is now augmented by an array of meta-analytic data that links self-efficacy to several well-researched and popular psychological constructs. More specifically, there are several areas where Bandura's (2006) conceptualization of self-efficacy as a constellation of largely independent, highly specific behavioral domains appears to be questionable. Most notably, the convergent validity meta-analysis found exceptionally large correlations among scales from all domains of self-efficacy under investigation. Even for analyses with relatively few studies this pattern of strongly positive correlations was maintained. In short, at least three behavioral domains of self-efficacy are highly intercorrelated; likely further research will reveal similar relationships among other efficacy domains. More importantly, general self-efficacy – considered superfluous and often inferior to specific self-efficacies by Bandura – demonstrates significant relationships with other behavioral domains as well.

In addition to providing solid evidence against Bandura's (2006) position of domain independence, this research adds further weight to previous analyses' treatment of self-efficacy as a stable, trait-like construct, rather than being wholly a function of more dynamic process such as vicarious experiences (Bandura, 1997). It bears repeating that self-efficacy displays significant, consistent relationships for four of the five factors of personality. The fact that these relationships are so stable across domains lends further

credence to the trait-like characteristics of the construct. Coupled with Judge and Bono's (2001) meta-analysis of Core Self-Evaluations, it appears that not only is self-efficacy highly related to these distal constructs (as compared to the more proximal phenomena such as motivation that characterize self-efficacy's dynamic nature), but it may form an essential part of a higher order personality structure.

Turning to other individual differences, self-efficacy appears to be only slightly related to general cognitive ability. While this relative lack of relationship does not preclude stronger correlations with specific cognitive abilities, it may provide support for Bandura's notion of more separate domains. As Chen et al. (2001) hypothesize in their own meta-analysis, this relationship may manifest as individuals' accurate evaluations of a task's difficulty (i.e., being better able to assess their own abilities, and thus efficacy). However, these evaluations are either rather minor or much more grounded in specific behaviors (i.e., specific domains), rather than in general self-efficacy.

Finally, the present research offers a bit of confirmatory evidence for Bandura's advocacy of domain-specific SE measures in the realm of criterion relationships. Across both academic and organizational criteria, the strongest predictors were usually those most related to the criterion of interest. An important caveat, however: while domain-specific measures (and highly specific measures within a behavioral domain) often functioned best, more general (and fully generalized) measures still offered some predictive power. Thus, Bandura's argument against decontextualized measures for predicting behaviors echoes another psychological debate: the concerns regarding the use of personality and integrity measures in selection settings due to faking. Similar to

Ones et al.'s (1995) argument in support of the use of personality scales, while there is some nontrivial relationship between constructs of interest, it remains a subjective judgment regarding whether or not to use a measure for prediction purposes.

Overall, it seems that the relationship between self-efficacy and other constructs is less cut and dried than either Bandura's (2006) domain-specific perspective or others' fully generalized SE philosophy can claim. While there are certainly robust relationships among behavioral domains, there is also no small merit to matching self-efficacy scales to specific criteria. Time and further research will tell to what degree either approach is warranted.

Moderators and Second Order Sampling Error

The current research has attempted to examine various SE-construct relationships across four major behavioral domains: academic self-efficacy, work-related self-efficacy, social self-efficacy, and general self-efficacy. Unlike previous meta-analyses which tend to investigate self-efficacy within a single behavioral domain (e.g., Judge & Ilies, 2002; Judge et al., 2007), this moderator analysis has allowed for direct comparison among quite different scales of self-efficacy. The downside to this type of moderator is that second order sampling error becomes a proportionally greater concern. In virtually every analysis conducted above, results were cast in terms of trends and patterns rather than highly stable point estimates with low variances. Accordingly, more advanced analyses such as regressions or structural equations modeling, were not deemed prudent given the variability of the estimates. While the ultimate goal is to gather more relevant studies to minimize the potential impact of sampling error at the meta-analytic level, the

fact that so many of the discovered trends were interpretable and unambiguous should lend some support to the findings. With the possible exception of analyses of behavioral domains populated by only a single study, these findings should serve as a valuable starting point.

In addition to examining relationships across various behavioral domains, the present research tried to examine potential differences due to SE scale specificity whenever possible. Similar to the difficulties raised by the previous moderator analysis, the specter of second order sampling error looms large throughout the research. Many supplemental analyses – particularly within the personality and job performance meta-analyses – were limited by sample sizes of fewer than five studies; breaking these results down by level of analysis often resulted in single studies populating a given category. When sample size issues were not a concern, however, these moderator analyses were quite illuminating. The foremost example, found in Table 47, illustrates the drop-off in predictive power for work-related SE scales predicting overall job performance at lower levels of specificity. This type of finding demonstrates both the incredible potential of self-efficacy measures as predictive tools (i.e., large correlations between highly-specific work-related SE and overall performance) and the sometimes strict limits on their optimal functioning (i.e., the significantly smaller correlations between less specific work-related SE and overall performance).

Another difficulty that arises from investigating SE scales at varying levels of specificity is the lack of item level information. While the current taxonomy of scale specificity attempts to be as consistent as possible, some scales remain difficult to

classify in the absence of the scale items themselves. Overall, what is needed is a finer-grained analysis of the specific contents of self-efficacy scales. By understanding which aspects of design render a scale more or less specific should allow future research to target criteria with greater ease and less error.

Limitations and Future Directions

While the current studies serve as an initial foray into the reliability and structure of self-efficacy, the domains under consideration constitute only a small proportion of the total potential areas where self-efficacy applies. As such, future research should examine other domains of self-efficacy, ranging from those of comparable breadth (e.g., computer and technology self-efficacy) to more specific, esoteric domains (e.g., snake-handling self-efficacy). In addition, more attention needs to be paid to potential differences within domains. For example, while the scales of career self-efficacy included here all assess a roughly similar construct, differences in terms of both item content and occupation may yield markedly different reliabilities when parsed apart. A more fine-grained and selective approach to domain demarcation in future research might grant us a better understanding of the boundaries between individual self-efficacy domains.

Similarly, one of the most common issues found in previous meta-analyses was the inappropriate mixing of different self-efficacy scales in a given analysis. Due to the breadth of the construct (and consequently, the sheer number of self-efficacy measures) researchers may be tempted to include every potentially relevant scale of self-efficacy they can find, regardless of its actual relationship to the other constructs under investigation. Accordingly, several meta-analyses – even some recent ones (e.g., Judge et

al., 2007; Richardson et al., 2012) – boost their overall ks at the expense of meaningful and interpretable effect sizes. In the case of Judge et al. (2007), the researchers intentionally excluded all generalized measures of self-efficacy, but collapsed across different job performance criteria. While some of these performance criteria are later separated in moderator analyses, the overall SE-performance coefficient used in their meta-analytic path model is a bit difficult to interpret in terms of specific SE-relationships.

In contrast, the present analyses may suffer from the opposite issue. Whereas previous meta-analyses have mixed different SE scales to bolster sample sizes, the present analyses have used a very stringent set of exclusionary criteria which, while admirable for yielding interpretable categories of SE measures, have drastically reduced the size of the relevant literature, sometimes by a full order of magnitude. Given the goal of the present research – to estimate population level relationships to better situate the construct of self-efficacy in the larger nomological network – this tradeoff was viewed as an acceptable sacrifice. However, the next logical step will be to await additional primary studies for enfolding into the appropriate meta-analyses to better estimate the magnitude of these relationships. Ultimately, these updated results, if in the same direction and general magnitude as present analyses, will need to be reconciled with the sometimes differing findings of other meta-analyses.

How can this be accomplished? The first step will be to further refine the taxonomy regarding levels of specificity within behavioral domains put forth in Table 11. The volume and diversity of self-efficacy measures is simultaneously the construct's

greatest asset and largest liability. Without a detailed structure to guide both the creation of future scales and the classification and organization of existing ones, researchers may be doomed to reinvent the wheel each time they use self-efficacy in their work. In addition, while Table 11 begins the process of delineating these different specificity levels, further exploration is needed to address other behavioral domains not covered in the present analysis and to better parse scales in the somewhat ambiguous meso-specific category. Although the number of studies contained within each category limited interpretation in the present research, the issue of specificity is likely the most important question that informs the core of Bandura's (2006) reluctance to use more general forms of self-efficacy. The present meta-analyses do much to highlight the advantages (and lack of advantages) inherent in the use of general self-efficacy scales. The small sample sizes that relate to individual analyses, however, fail to provide full resolution to this issue.

While much work remains to be done to incorporate more detail and distinction across all behavioral domains, the domain perhaps most affected in the current analyses is work-related self-efficacy. Given the breadth of organizationally relevant criteria, the essential question for self-efficacy becomes: self-efficacy for what? Accordingly, determining the precise convergence among SE scales of different criteria (e.g., how strongly do scales of task performance SE correlate with scales of contextual performance SE?) becomes a necessary priority if the goal is an improved understanding of the SE construct. In addition, more criterion-focused studies are needed to establish how well SE scales predict various criteria when predictor and criterion are not matched to one another (e.g., how well does task performance SE predict contextual

performance?). The present meta-analysis begins this process, but the existing data from primary studies are woefully sparse.

Taken as whole, these analyses represent a substantial addition to the research literature. For example, while previous studies have examined the relationships between general self-efficacy and personality (Judge & Ilies, 2002) or work-related self-efficacy and work related performance (Judge et al., 2007; Stajkovic & Luthans, 1998), none have investigated these relationships among multiple domains of self-efficacy simultaneously. Furthermore, no researcher has examined the potential convergence among scales of self-efficacy. Just as important as the new data, however, is the identification of a number of important gaps in the existing literature at both the primary and meta-analytic level. Similar to Wanous, Reichers, and Hudy's (1997) investigation of single-item scales of job satisfaction, a comparable study is needed to determine how well single-item scales of self-efficacy compare to their longer counterparts with respect to coefficient alpha. Given differences in internal consistency across behavioral domains at the full scale level, it is probable that there are similar differences in single-item measures. Turning to issues of convergence, it is clear that some domains of self-efficacy receive far less attention than others in terms of primary study quantity in the published literature. Most notably, scales of general and social self-efficacy are lacking proportional representation as compared to academic and social self-efficacy scales. Studies examining their relationships not only with other constructs of interest but also among themselves will do much to further understanding of their place in the larger nomological network.

While there is no immediate shortage of studies treating the relationship between self-efficacy and personality factors, less attention has been given to relationships at other levels of the personality hierarchy. Judge and Bono (2001) have made inroads at the higher-order factor level with their discussion of Core Self-Evaluations, but almost no information is available to analyze facet level relationships. Given the current results demonstrating self-efficacy's consistent relationships with the Big Five, researchers may be tempted to restrict their focus to this level of analysis. However, the differences seen in factor agreeableness by behavioral domain may have analogues with the other four factors at the subordinate facet level. In addition to uncovering more fine-grained potential differences in predictive power across behavioral domains, such research might also yield incremental validity by adding more highly specific (i.e., facet level) information. Furthermore, specific facet level relationships could further inform how self-efficacy manifests in certain different situations.

As far as the relationships between self-efficacy and performance (both academic and organizational) are concerned, there are few limitations of the present analyses that would go unsolved through the addition of more relevant data. Thanks to research and interest in the realm of job performance (e.g., Campbell et al., 1993) there is a generally accepted theory that organizes the components of performance and their respective antecedents. Unfortunately, a comparable organizing scheme is lacking from the self-efficacy literature. There is little understanding of the boundaries necessary to tailor self-efficacy measures either precisely to predict a single criterion or more broadly to predict an array of criteria. In a related vein, future research should examine the potential

incremental validity of various self-efficacy scales to predict criteria in combination. For example, do we gain substantial predictive power by using general self-efficacy to predict job performance above and beyond work-related self-efficacy? If so, there may be justification for using multiple SE scales from contrasting behavioral domains to augment prediction. Echoing a concern raised above, the general ignorance of these issues likely stems from a lack of interest in item-level analyses of self-efficacy scales. While the present research supports using highly specific scales to predict criteria of interest, it does not advocate hastily tailored measures designed on a purely rational basis. To address this concern, future research must examine self-efficacy scales not just in the aggregate, but individually.

After over thirty years since its initial proposition, self-efficacy research has never been more popular, widespread, or useful. Perhaps more importantly, psychologists are continuing to delve into not only the dynamic mechanisms of self-efficacy's operation and the criteria it predicts, but also its more stable predictors. The fact that self-efficacy is a function of individuals' experiences and observations – direct or vicarious – is not in dispute. Now, however, more and more researchers have begun to examine the individual difference aspects of self-efficacy. Just as personality research has benefited enormously from a known taxonomy and structure (Barrick & Mount, 1991), so should self-efficacy research. With further research and attention given to self-efficacy's place in the larger nomological net, we may hope to see a similar renaissance.

Table 1

Previous Definitions of Self-Efficacy

Author	Year	Self-Efficacy Definition
Bandura	1977	"An efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcomes." (p. 193)
Bandura	1980/ 1982	"Self-efficacy is concerned with judgments of the likelihood that one can organize and execute given courses of action required to deal with prospective situations." (p. 263)
Bandura	1984	"Perceived self-efficacy is concerned with people's judgments of their capabilities to execute given levels of performance." (p. 232)
Bandura	1989/ 1991	"[P]eople's beliefs about their capabilities to exercise control over events that affect their lives." (p. 1175)
Bandura et al.	1996	"[P]eople's beliefs in their capabilities to exercise control over their level of functioning and environmental demands." (p. 1206)
Bandura	1997	"Perceived self-efficacy is concerned with people's beliefs in their capabilities to produce given attainments."

Table 2

Self-Efficacy and Demographic/Background Variables

Authors	Predictor	Criterion	N	k	r
Holden et al. (1990)	SE - Unspecified	Child Behavior	1,692	26	0.33
Judge et al. (2007)	Generalized SE	Experience	2,827	7	0.05

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 3

Self-Efficacy and Psychological Health/Functioning Variables

Authors	Predictor	Criterion	N	k	r
Alarcon, Eschleman, & Bowling (2009)	Generalized SE	Emotional Exhaustion	6,687	16	-0.21
Alarcon, Eschleman, & Bowling (2009)	Generalized SE	Depersonalization	6,687	16	-0.21
Alarcon, Eschleman, & Bowling (2009)	Generalized SE	Personal accomplishment	4,742	12	0.38
Bauer et al. (2007)	SE - role and job task mastery	Social Acceptance of Newcomers at work	872	4	0.28
Beaudoin & Descrichard (2011)	Memory SE - Global	Memory performance	16,234	71	0.15
Beaudoin & Descrichard (2011)	Memory SE - Domain Specific	Memory performance	409	3	0.18
Beaudoin & Descrichard (2011)	Memory SE - Concurrent	Memory performance	5,743	64	0.20
Hagger et al. (2010)	SE - Unspecified	Ego Depletion	210	5	0.08
Luszczynska, Benight, & Cieslak (2009)	SE - General & Trauma-Specific	General Distress	748	7	-0.50
Luszczynska, Benight, & Cieslak (2009)	SE - General & Trauma-Specific	PTSD Symptoms - Frequency	61	2	-0.77
Luszczynska, Benight, & Cieslak (2009)	SE - General & Trauma-Specific	PTSD Symptoms - Severity	525	4	-0.36

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 4

Self-Efficacy and Job Performance Variables

Authors	Predictor	Criterion	N	k	r
Bauer et al. (2007)	SE - role and job task mastery	Job Performance of Newcomers at work	724	6	0.35
Judge & Bono (2001)	Generalized SE	Job Performance	1,122	10	0.19
Judge et al. (2007)	Generalized SE	Job Performance	10,786	72	0.16
Lent, Brown, & Hackett (1994)	Generalized SE	Job Performance	N/A	9	0.38
Stajkovic & Luthans (1998)	SE - Specific	Job Performance	21,616	157	0.34

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 5

Self-Efficacy and Work Behavior Variables (Besides Job Performance)

Authors	Predictor	Criterion	N	k	r
Bauer et al. (2007)	SE - role and job task mastery	Turnover among Newcomers at work	272	2	-0.16
Rauch & Frese (2007)	Generalized SE	Business creation	2,250	8	0.33
Rauch & Frese (2007)	Generalized SE	Entrepreneurial Success	1,331	11	0.20

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 6

Self-Efficacy and Training-Related/Academic Variables

Authors	Predictor	Criterion	N	k	r
Multon, Brown, & Lent (1991)	SE - Unspecified	Academic Performance	4,998	38	0.38
Richardson, Abraham, & Bond (2012)	Academic SE	GPA	46,570	67	0.31
Richardson, Abraham, & Bond (2012)	Performance SE	GPA	1,348	4	0.59
Robbins et al. (2004)	Academic SE	Academic Retention	6,930	6	0.25
Robbins et al. (2004)	General Self-Concept	Academic Retention	4,240	6	0.05
Robbins et al. (2004)	Academic SE	GPA	9,598	18	0.37
Robbins et al. (2004)	General Self-Concept	GPA	9,621	21	0.03
Sitzmann et al. (2008)	SE - Pretraining	Training Reaction	3,944	30	0.12
Sitzmann et al. (2008)	SE - Posttraining	Training Reaction	3,543	22	0.25

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 7

Self-Efficacy and Attitudinal Variables

Authors	Predictor	Criterion	N	k	r
Allen et al. (2012)	SE – Unspecified	Work interfering with family	1,947	7	-0.24
Allen et al. (2012)	SE – Unspecified	Family interfering with work	1,314	7	-0.31
Bauer et al. (2007)	SE - role and job task mastery	Job Satisfaction of Newcomers at work	1,162	8	0.28
Bauer et al. (2007)	SE - role and job task mastery	Org Commitment of Newcomers at work	1,620	8	0.20
Bauer et al. (2007)	SE - role and job task mastery	Intention to Remain for Newcomers at work	841	7	0.15
Judge & Bono (2001)	Generalized SE	Job Satisfaction	12,903	12	0.38
Rodgers, Conner, & Murray (2008)	SE - Unspecified	Exercise intention	1,204	9	0.63
Rodgers, Conner, & Murray (2008)	SE - Unspecified	Exercise attitude	1,204	9	0.46

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 8

Self-Efficacy and Motivational Variables

Authors	Predictor	Criterion	N	k	r
Cellar et al. (2011)	Academic SE	Mastery Approach Goal Orientation	10,217	49	0.33
Cellar et al. (2011)	Academic SE	Performance Approach Goal Orientation	4,572	21	0.10
Cellar et al. (2011)	Academic SE	Performance Avoid Goal Orientation	4,572	21	-0.13
Floyd et al. (2000)	SE - response	Protection Motivation	7,666	41	0.04
Payne, Youngcourt, & Beaubien (2007)	Generalized SE	Learning Goal Orientation	2,366	9	0.56
Payne, Youngcourt, & Beaubien (2007)	Generalized SE	Prove Performance Goal Orientation	2,366	9	-0.06
Payne, Youngcourt, & Beaubien (2007)	Generalized SE	Avoid Performance Goal Orientation	944	3	-0.47
Payne, Youngcourt, & Beaubien (2007)	Specific SE	Learning Goal Orientation	10,649	49	0.31
Payne, Youngcourt, & Beaubien (2007)	Specific SE	Prove Performance Goal Orientation	9,266	44	0.03
Payne, Youngcourt, & Beaubien (2007)	Specific SE	Avoid Performance Goal Orientation	1,882	8	-0.21
Sitzmann & Ely (2011)	SE - Unspecified	Persistence	6,353	21	0.49
Sitzmann & Ely (2011)	SE - Unspecified	Motivation	11,765	45	0.48
Sitzmann & Ely (2011)	SE - Unspecified	Effort	3,428	18	0.1
Steel (2007)	SE - Unspecified	Procrastination	6,994	39	-0.38
van Erde (2003)	SE - Unspecified	Procrastination	2,882	11	-0.44
Webb & Sheeran (2008)	SE - Unspecified	Goal Intention	1,067	9	0.05

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 9

Self-Efficacy and Personal Life Variables (Non-Work, Non-Academic)

Authors	Predictor	Criterion	N	k	r
Casey et al. (2009)	Response SE	Condom Use	11,568	34	0.09
Dunst, Trivette, & Hamby (2007)	SE - Unspecified	Help-Giving Practices - Relational	1,765	32	0.61
Dunst, Trivette, & Hamby (2007)	SE - Unspecified	Help-Giving Practices - Participatory	2,015	43	0.59
Noar, Pierce, & Black (2010)	Refusal SE	Condom Use	1,345	4	0.02
Noar, Pierce, & Black (2010)	Condom Use SE	Condom Use	3,308	10	0.09
Rodgers, Conner, & Murray (2008)	SE - Unspecified	Exercise behavior	1,204	9	0.46
Yarcheski et al. (2004)	SE - Unspecified	Positive Health Practices	517	3	0.31

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 10

Self-Efficacy and Individual Difference Correlates

Authors	Predictor	Criterion	N	k	r
Fuller & Marler (2009)	Role Breadth SE	Proactive Personality	1,698	5	0.42
Judge & Ilies (2002)	SE Motivation	Neuroticism	6,730	32	-0.29
Judge & Ilies (2002)	SE Motivation	Extraversion	2,067	7	0.24
Judge & Ilies (2002)	SE Motivation	Openness to Experience	755	3	0.15
Judge & Ilies (2002)	SE Motivation	Agreeableness	1,099	6	0.09
Judge & Ilies (2002)	SE Motivation	Conscientiousness	3,483	14	0.17
Rottinghaus, et al. (2003)	SE - Realistic Interests	Realistic Interests	30,590	18	0.67
Rottinghaus, et al. (2003)	SE - Investigative Interests	Investigative Interests	30,590	18	0.68
Rottinghaus, et al. (2003)	SE - Artistic Interests	Artistic Interests	30,410	17	0.64
Rottinghaus, et al. (2003)	SE - Social Interests	Social Interests	30,410	17	0.54
Rottinghaus, et al. (2003)	SE - Enterprising Interests	Enterprising Interests	30,590	18	0.50
Rottinghaus, et al. (2003)	SE - Conventional Interests	Conventional Interests	30,410	17	0.53
Rottinghaus, et al. (2003)	SE - Art	Art Interests	6,343	2	0.62
Rottinghaus, et al. (2003)	SE - Math	Math Interests	6,166	7	0.73
Rottinghaus, et al. (2003)	SE - Science	Science Interests	5,672	3	0.69
Rottinghaus, et al. (2003)	SE - Math/Science	Math/Science Interests	2,217	4	0.51
Rottinghaus, et al. (2003)	SE - Traditional Female Occupations	Traditional Female Occupations	1,540	7	0.40
Rottinghaus, et al. (2003)	SE - Traditional Male Occupations	Traditional Male Occupations	1,904	8	0.47

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables.

Table 11
Self-Efficacy Specificity X Self-Efficacy Domain Definitions

	General Domain	Academic Domain	Work-Related Domain	Social Domain
General	General SE	Measures that either cross several larger academic domains (e.g., combining both Quantitative SE and Verbal SE) or do not specify a single domain beyond 'general academic behavior	Measures that either cross several larger work-related domains (e.g., combining both Task SE and Contextual SE) or do not specify a single domain beyond 'general work-related' behavior	Measures that either cross several larger social domains (e.g., combining both interpersonal SE and emotional SE) or do not specify a single domain beyond 'general social behavior'
Meso-Specific	N/A	Measures that cross several conceptually linked academic domains (e.g., Quantitative SE subsumes various types of mathematical SE)	Measures that cross several conceptually linked work-related domains (e.g., Job Task SE subsumes various types task-specific of SE)	Measures that cross several conceptually linked social domains (e.g., interpersonal SE subsumes various types of impression-management SE)
Highly-Specific	N/A	Measures restricted to a single domain of academic behavior (e.g., Algebra SE; English SE)	Measures restricted to a single domain of work-related behavior (e.g., Sales SE; Telemarketing SE)	Measures restricted to a single domain of social behavior (e.g., Contingency Contracting SE)

Table 12
Reliability of Self-efficacy Scale Score Reliabilities: Meta-Analytic Results and Scale Descriptive Statistics

	N	k	Mean # of Items	SD # of Items	Modal # of Items	Min # of Items	Max # of Items	ρ_α	SD_ρ	90% CI for ρ_α	Mean Inter-item r	SD of Inter-item r	90% CI for ρ_α
Full Sample	193,234	566	16	18	10	2	190	.891	3.843E-4	(.890, .892)	.385	.161	(.225, .546)
Academic	55,904	177	13	13	5	2	75	.898	6.751E-4	(.897, .899)	.437	.164	(.273, .600)
Work-Related	85,782	264	19	23	25	2	190	.904	5.118E-4	(.903, .905)	.374	.163	(.211, .538)
Social	7,920	26	16	11	25	2	40	.910	1.531E-3	(.907, .912)	.372	.153	(.218, .525)
General	48,327	113	12	7	10	3	57	.841	1.091E-3	(.840, .842)	.340	.126	(.214, .465)

Table 13
Predicted Reliability of Self-efficacy Scale Scores in Different Domains

# of Items	1	2	3	4	5	6	7	8	9	10	15	20	25	30	40	50	75	90	100
Total	.39	.56	.65	.71	.76	.79	.81	.83	.85	.86	.90	.93	.94	.95	.96	.97	.98	.98	.98
Academic	.44	.61	.70	.76	.80	.82	.84	.86	.87	.89	.92	.94	.95	.96	.97	.97	.98	.99	.99
Work-Related	.37	.54	.64	.70	.75	.78	.81	.83	.84	.86	.90	.92	.94	.95	.96	.97	.98	.98	.98
Social	.37	.54	.64	.70	.75	.78	.81	.83	.84	.86	.90	.92	.94	.95	.96	.97	.98	.98	.98
General	.34	.51	.61	.67	.72	.76	.78	.80	.82	.84	.89	.91	.93	.94	.95	.96	.97	.98	.98

Table 14

Academic Self-Efficacy Convergence

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Acad. SE – Acad. SE	6,014	20	0.50	0.12	0.58	0.12	0.38	0.78
Acad. SE – Work SE	2,421	7	0.45	0.14	0.52	0.14	0.29	0.75
Acad. SE – Gen. SE	1,746	8	0.44	0.21	0.52	0.23	0.14	0.90
Acad. SE – Soc. SE	1,928	6	0.50	0.09	0.59	0.08	0.46	0.72

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 15

Work-Related Self-Efficacy Convergence

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Work SE – Work SE	7,919	31	0.50	0.21	0.59	0.23	0.21	0.97
Work SE – Acad. SE	2,421	7	0.45	0.14	0.52	0.14	0.29	0.75
Work SE – Gen. SE	4,277	16	0.40	0.16	0.48	0.18	0.18	0.78
Work SE – Soc. SE	2,466	4	0.45	0.06	0.53	0.05	0.45	0.61

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 16

General Self-Efficacy Convergence

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Gen. SE – Gen. SE	1,706	5	0.59	0.09	0.71	0.08	0.58	0.84
Gen. SE – Acad. SE	1,746	8	0.44	0.21	0.52	0.23	0.14	0.90
Gen. SE – Work SE	4,277	16	0.40	0.16	0.48	0.18	0.18	0.78
Gen. SE – Soc. SE	563	4	0.48	0.04	0.57	0.00	0.57	0.57

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 17

Social Self-Efficacy Convergence

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Soc. SE – Soc. SE	1,063	4	0.51	0.08	0.59	0.06	0.49	0.69
Soc. SE – Acad. SE	1,746	8	0.44	0.21	0.52	0.23	0.14	0.90
Soc. SE – Work SE	4,277	16	0.40	0.16	0.48	0.18	0.18	0.78
Soc. SE – Gen. SE	563	4	0.48	0.04	0.57	0.00	0.57	0.57

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 18

Levels of Specificity within Academic SE Domains

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Full Sample	6,014	20	0.50	0.12	0.58	0.12	0.38	0.78
Specificity Match	3,218	10	0.47	0.10	0.55	0.10	0.39	0.71
Specificity Mismatch	2,796	10	0.54	0.12	0.63	0.13	0.42	0.84

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 19

Levels of Specificity within Work-Related SE Domains

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Full Sample	7,919	31	0.50	0.21	0.59	0.23	0.21	0.97
Specificity Match	3,751	15	0.61	0.19	0.72	0.21	0.37	1.00
Specificity Mismatch	4,168	16	0.40	0.16	0.47	0.17	0.19	0.75

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 20

Convergence Within and Across Behavioral Domains

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Academic/Academic	6,014	20	0.50	0.12	0.58	0.12	0.38	0.78
Academic/Work-Related	2,421	7	0.45	0.14	0.52	0.14	0.29	0.75
Academic/General	1,746	8	0.44	0.21	0.52	0.23	0.14	0.90
Academic/Social	1,928	6	0.50	0.09	0.59	0.08	0.46	0.72
Work-Related/Work-Related	7,919	31	0.50	0.21	0.59	0.23	0.21	0.97
Work-Related/General	4,277	16	0.40	0.16	0.48	0.18	0.18	0.78
Work-Related/Social	2,466	4	0.45	0.06	0.53	0.05	0.45	0.61
General/General	1,706	5	0.59	0.09	0.71	0.08	0.58	0.84
General/Social	563	4	0.48	0.04	0.57	0.00	0.57	0.57
Social/Social	1,063	4	0.51	0.08	0.59	0.06	0.49	0.69

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 21

Convergence Matrix

	Academic SE	Career SE	General SE	Social SE
Academic SE	.50 (.58)	0.52	0.52	0.59
Career SE	0.45	.50 (.59)	0.48	0.53
General SE	0.44	0.40	.59 (.71)	0.57
Social SE	0.50	0.45	0.48	.51 (.50)

Note. Corrected values (corrected for unreliability in both variables) appear in parentheses and above the diagonal.

Table 22

Neuroticism/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	7,258	15	-0.48	0.12	-0.59	0.13	-0.80	-0.38
Academic	2,874	6	-0.24	0.12	-0.29	0.14	-0.52	-0.06
Work-Related	5,515	19	-0.33	0.15	-0.40	0.16	-0.66	-0.14
Social	2,357	5	-0.42	0.14	-0.52	0.16	-0.78	-0.26
Judge & Ilies (2002)	6,730	32	-0.29	-	-0.35	0.18	-0.64	-0.05

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 23

Extraversion/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	6,572	12	0.45	0.09	0.56	0.10	0.40	0.72
Academic	513	2	0.20	0.14	0.25	0.15	0.00	0.50
Work-Related	5,197	20	0.33	0.12	0.40	0.12	0.20	0.60
Social	1,618	4	0.37	0.06	0.46	0.05	0.38	0.54
Judge & Ilies (2002)	2,067	7	0.24	-	0.33	0.16	0.07	0.59

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 24

Openness to Experience/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	6,844	13	0.28	0.13	0.36	0.15	0.11	0.61
Academic	2,300	6	0.28	0.28	0.35	0.34	-0.21	0.91
Work-Related	5,334	16	0.20	0.10	0.26	0.11	0.08	0.44
Social	863	2	0.28	0.02	0.36	0.00	0.36	0.36
Judge & Ilies (2002)	755	3	0.15	-	0.20	0.04	0.13	0.27

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 25

Agreeableness/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	5,579	8	-0.01	0.15	-0.01	0.19	-0.32	0.30
Academic	843	2	0.25	0.12	0.31	0.13	0.10	0.52
Work-Related	3,789	13	0.13	0.08	0.17	0.06	0.07	0.27
Social	124	1	0.02	0.00	0.03	0.00	0.03	0.03
Judge & Ilies (2002)	1,099	6	0.09	-	0.11	0.17	-0.17	0.40

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 26

Conscientiousness/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	6,505	12	0.43	0.11	0.53	0.13	0.32	0.74
Academic	1,287	6	0.45	0.16	0.55	0.18	0.25	0.85
Work-Related	4,681	17	0.35	0.10	0.43	0.10	0.27	0.59
Social	124	1	0.33	0.00	0.41	0.00	0.41	0.41
Judge & Ilies (2002)	3,483	14	0.17	-	0.22	0.15	-0.03	0.47
Richardson et al. (2012)	1,267	5	0.23	-	-	-	-	-

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 27

Negative Affectivity/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	629	4	-0.38	0.08	-0.48	0.05	-0.56	-0.40
Social	769	2	-0.30	0.06	-0.36	0.03	-0.41	-0.31

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 28

Positive Affectivity/SE Correlations by Behavioral Domain

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General	607	2	0.52	0.06	0.65	0.05	0.57	0.73
Academic	946	2	0.30	0.09	0.37	0.09	0.22	0.52
Work-Related	366	1	0.42	0.00	0.53	0.00	0.53	0.53
Social	946	3	0.17	0.11	0.21	0.12	0.01	0.41

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 29

Levels of Specificity within Neuroticism/Academic SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	2,874	6	-0.24	0.12	-0.29	0.14	-0.52	-0.06
Highly-Specific	1,755	4	-0.27	0.15	-0.32	0.17	-0.60	-0.04
Meso-Specific	228	1	-0.25	0.00	-0.32	0.00	-0.32	-0.32
General	891	1	-0.19	0.00	-0.23	0.00	-0.23	-0.23

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 30

Levels of Specificity within Neuroticism/Work-Related SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	5,515	19	-0.33	0.15	-0.40	0.16	-0.66	-0.14
Highly-Specific	1,345	4	-0.22	0.09	-0.26	0.09	-0.41	-0.11
Meso-Specific	494	2	-0.25	0.01	-0.31	0.00	-0.31	-0.31
General	3,676	13	-0.37	0.15	-0.46	0.17	-0.74	-0.18

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 31

Levels of Specificity within Neuroticism/Social SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	2,357	5	-0.42	0.14	-0.52	0.16	-0.78	-0.26
Highly-Specific	863	2	-0.25	0.04	-0.30	0.00	-0.30	-0.30
General	1,494	3	-0.53	0.03	-0.64	0.00	-0.64	-0.64

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 32

Levels of Specificity within Extraversion/Work-Related SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	5,197	20	0.33	0.12	0.40	0.12	0.20	0.60
Highly-Specific	1,027	5	0.36	0.17	0.45	0.19	0.14	0.76
Meso-Specific	494	2	0.36	0.02	0.44	0.00	0.44	0.44
General	3,676	13	0.31	0.10	0.38	0.10	0.22	0.54

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 33

Levels of Specificity within Extraversion/Social SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	1,618	4	0.37	0.06	0.46	0.05	0.38	0.54
Highly-Specific	124	1	0.29	0.00	0.36	0.00	0.36	0.36
General	1,494	3	0.38	0.06	0.46	0.05	0.38	0.54

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 34

Levels of Specificity within Openness to Experience/Academic SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	2,300	6	0.28	0.28	0.35	0.34	-0.21	0.91
Highly-Specific	1,582	3	0.25	0.32	0.32	0.41	-0.35	0.99
General	718	3	0.34	0.07	0.43	0.04	0.36	0.50

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 35

Levels of Specificity within Openness to Experience/Work-Related SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	5,334	16	0.20	0.10	0.26	0.11	0.08	0.44
Highly-Specific	2,078	6	0.18	0.14	0.23	0.16	-0.03	0.49
Meso-Specific	100	1	0.27	0.00	0.37	0.00	0.37	0.37
General	3,156	9	0.22	0.07	0.27	0.06	0.17	0.37

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 36

Levels of Specificity within Agreeableness/Work-Related SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	3,789	13	0.13	0.08	0.17	0.06	0.07	0.27
Highly-Specific	533	3	0.25	0.10	0.31	0.08	0.18	0.44
Meso-Specific	100	1	0.21	0.00	0.27	0.00	0.27	0.27
General	3,156	9	0.11	0.05	0.14	0.00	0.14	0.14

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 37

Levels of Specificity within Conscientiousness/Academic SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	1,287	6	0.45	0.16	0.55	0.18	0.25	0.85
Highly-Specific	647	3	0.41	0.21	0.50	0.25	0.09	0.91
Meso-Specific	228	1	0.51	0.00	0.64	0.00	0.64	0.64
General	412	2	0.49	0.01	0.59	0.00	0.59	0.59

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 38

Levels of Specificity within Conscientiousness/Work-Related SE Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	4,681	17	0.35	0.10	0.43	0.10	0.27	0.59
Highly-Specific	826	5	0.31	0.08	0.38	0.04	0.31	0.45
Meso-Specific	699	3	0.27	0.03	0.33	0.00	0.33	0.33
General	3,156	9	0.38	0.10	0.47	0.10	0.31	0.63

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 39

General SE/Cognitive Ability Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
General Mental Ability	2,079	7	0.07	0.03	0.08	0.00	0.08	0.08
General Mental Ability (Nonverbal)	482	3	0.05	0.03	0.07	0.00	0.07	0.07

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 40

Academic SE/General Mental Ability Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	4,863	19	0.20	0.11	0.22	0.11	0.04	0.40
Highly-Specific	2,135	10	0.16	0.11	0.18	0.10	0.02	0.34
Meso-Specific	924	6	0.23	0.11	0.27	0.09	0.12	0.42
General	1,804	3	0.22	0.11	0.26	0.11	0.08	0.44

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 41

Academic SE/General Mental Ability (Nonverbal) Correlations

N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
1,083	2	0.28	0.06	0.35	0.06	0.25	0.45

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 42

Work-Related SE/General Mental Ability Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	1,422	10	0.15	0.14	0.17	0.12	-0.03	0.37
Highly-Specific	483	4	0.18	0.13	0.21	0.10	0.05	0.37
Meso-Specific	632	3	0.09	0.14	0.10	0.14	-0.13	0.33
General	487	4	0.17	0.10	0.19	0.05	0.11	0.27

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 43

Self-Efficacy/Academic Performance Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% Upper
General SE	1,560	8	0.17	0.10	0.20	0.08	0.07	0.33
Academic SE[a]	46,570	67	0.28	-	0.31	0.01	0.29	0.33
Performance SE[a]	1,348	4	0.59	-	0.67	0.00	0.67	0.67

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.[a] Richardson et al. (2012)

Table 44

Academic SE/Job Performance (All Types) Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Job Perf.	199	1	0.26	0.00	0.33	0.00	0.33	0.33
OCB	233	1	0.29	0.00	0.35	0.00	0.35	0.35
Training Perf.	666	1	0.36	0.00	0.40	0.00	0.40	0.40

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 45

Social SE/Job Performance (All Types) Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
OCB	99	1	0.03	0.00	0.03	0.00	0.03	0.03
Tenure	110	1	0.24	0.00	0.26	0.00	0.26	0.26

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 46

General SE/ Job Performance (All Types) Correlations

	N	k	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Job Perf.	1,075	5	0.12	0.06	0.16	0.00	0.16	0.16
OCB	613	2	0.36	0.03	0.42	0.00	0.42	0.42
Extrinsic career success measures[a]	595	2	0.10	0.07	0.11	0.03	0.06	0.16
Objective performance measures[b]	190	2	0.37	0.27	0.43	0.28	-0.03	0.89

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.[a](e.g., promotions, salary increases)
[b](e.g., quantity of sales)

Table 47

Work-Related SE/Overall Job Performance Correlations

	N	K	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	3,984	24	0.19	0.12	0.26	0.12	0.06	0.46
Highly-Specific	476	6	0.32	0.15	0.44	0.13	0.23	0.65
Meso-Specific	1,603	8	0.16	0.13	0.22	0.14	-0.01	0.45
General	1,905	10	0.18	0.08	0.25	0.00	0.25	0.25
Judge et al. (2007)	32,123	217	0.24	-	0.37	-	0.37	0.37

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 48

Work-Related SE/Self-Rated Job Performance Correlations

	N	K	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	1,453	6	0.25	0.18	0.32	0.21	-0.03	0.67
Highly-Specific	1,211	5	0.26	0.20	0.33	0.23	-0.05	0.71
Meso-Specific	242	1	0.21	0.00	0.27	0.00	0.27	0.27
General	1,453	6	0.25	0.18	0.32	0.21	-0.03	0.67

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

Table 49

Work-Related SE/Objective Performance Measure Correlations

	N	K	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Overall Analysis	1,415	11	0.21	0.16	0.24	0.15	-0.01	0.49
Highly-Specific	933	6	0.16	0.17	0.18	0.17	-0.10	0.46
Meso-Specific	342	2	0.10	0.04	0.11	0.00	0.11	0.11
General	443	4	0.32	0.01	0.36	0.00	0.36	0.36

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.

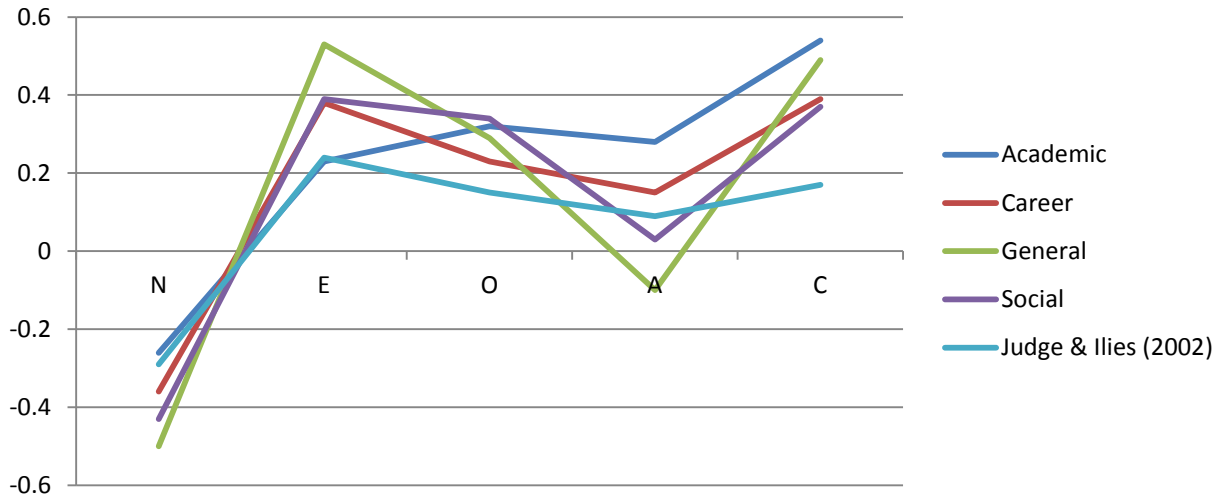
Table 50

Work-Related SE/Other Performance Measure Correlations

	N	K	r	SD_r	ρ	SD_ρ	90% CV Lower	90% CV Upper
Absenteeism	311	1	-0.09	0.00	-0.12	0.00	-0.12	-0.12
Adaptive Perf.	655	3	0.20	0.07	0.22	0.00	0.20	0.22
Extrinsic career success measures	465	2	0.19	0.05	0.20	0.00	0.20	0.20

Note. N = total number of participants; k = total number of samples; r = observed correlation between variables; SD_r = standard deviation of observed correlations; ρ = estimated population-level correlation (i.e., corrected for unreliability of measurement); SD_ρ = standard deviation of population-level correlations; 90% CV Lower = lower limit to 90% Credibility Interval; 90% CV Upper = upper limit to 90% Credibility Interval.[a](e.g., promotions, salary increases)

Figure 1
Correlations between Self-Efficacy and the Five Factor Model of Personality



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Appendix A

Studies Included in Reliability Generalization

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Appendix B

Studies Included in Convergent Validity Meta-Analyses

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Appendix C

Studies Included in SE-Personality Meta-Analyses

Bernard, L. C., Hutchison, S., Lavin, A., & Pennington, P. (1996). Ego-Strength, Hardiness, Self-Esteem, Self-Efficacy, Optimism, and Maladjustment: Health-Related Personality Constructs and the â€œBig Fiveâ€ Model of Personality. *Assessment, 3*, 115.

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Heppner, M. J., Multon, K. D., Gysbers, N. C., Ellis, C. A., & Zook, C. E. (1998). The relationship of trainee self-efficacy to the process and outcome of career counseling. *Journal of Counseling Psychology, 45*, 393.

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Appendix F

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