Peak Performance: An Empirical Examination in Workplace Settings

By
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A Thesis Submitted to
Saint Mary's University, Halifax, Nova Scotia
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in Industrial/Organizational Psychology

April, 2021, Halifax, Nova Scotia

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Date: April 30, 2021

Abstract

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Understanding job performance has been an important and longstanding workplace challenge for over a century. However, continued criterion deficiency has resulted in ongoing disparity between job performance and job performance ratings (Murphy, 2008). In response, this dissertation broadens the traditional focus of job performance to consider the factors that characterize peak performance (i.e., exceptional or optimal performance; Garfield, 1986). Peak performance is a well-established concept in performance psychology that is beginning to emerge in the broader organizational literature (Hays, 2009). However, there is no known empirical work assessing its relation to traditional workplace factors. Therefore, in Study 1, peak performance was conceptualized; exploratory analyses were conducted on a newly-developed measure; and relationships between peak performance and three well-established job performance concepts were examined. They include task performance (Borman & Motowidlo, 1997; Williams & Anderson, 1991); organizational citizenship behavior (Borman & Motowidlo, 1997; Dalal, 2005; Dunlop & Lee, 2004); and counterproductive work behavior (Dalal, 2005; Dunlop & Lee, 2004). Study 2 used confirmatory factor analysis on two independent samples to confirm the peak performance measure. Regression, redundancy, moderator, and relative weights analyses demonstrated the construct and predictive validity of peak performance. Using two-way multivariate analysis of covariance, Study 3 applied the refined measure in an experimental design to demonstrate the individual and combined effects of expected performance and peak performance on ratings of three important workplace outcomes: acknowledgement, rewardability, and promotability. Together, the studies show that it is possible and important to consider peak performance in workplace research and practice. Future research should identify the individual, role, organizational, and external factors that predict peak performance. Having a better understanding of the multidimensional nature of peak performance could improve personnel-related practices, including recruitment, selection, training, performance appraisal, and promotion decisions, resulting in a better-fitting workforce that is more capable and effective.

April 30, 2021

Acknowledgements

My journey to where I am today was long and challenging and would not have been possible without tremendous and noteworthy care and support all along the way. I have many to thank and wish to begin with Saint Mary's University (SMU), the Faculty of Graduate Studies, and the Psychology Department for all of the opportunities that have enriched my life. I am very grateful and proud to say that I earned a BA, MSc, and PhD from SMU and that I have been a part-time instructor for the Psychology Department at SMU since 2006. I look forward with excitement to our continued relationship.

Dr. Victor Catano deserves special thanks for his vital role in my life, academically as my MSc and PhD advisor and professionally as my teaching employer for many years during his role as the Psychology Department Chair. Vic was my primary reason for choosing I/O psychology at SMU for my graduate degree programs. Vic made me feel worthy and capable. He challenged and praised me and supported me unconditionally. I will always remember Vic fondly and am grateful for the many years he stood by my side.

A special thanks to Dr. E. Kevin Kelloway, most notably, for offering to be my advisor after Vic passed away. I have grown immensely since Kevin's Masters Multivariate Statistics class and from his guidance as a thesis committee member during my MSc and PhD programs. Kevin is brilliant, fair, humorous, and kind. He has challenged me in ways that I never thought possible. I definitely look forward to future collaborations with excitement.

Dr. Jim Cameron also deserves exceptional recognition for serving on my dissertation committee and for supervising my early research on music therapy, which helped to pave the path to my dissertation. I very much appreciate the loyalty, support, insight, and dynamic working friendship we share. I look forward to opportunities to work together again.

Dr. Arla Day also deserves many thanks. Arla shows exemplary commitment to her students, formally and informally. Along with taking her MSc and PhD courses, Arla connected me to the Canadian Forces during Masters and coached me right up to the final hours before my PhD dissertation defence. It means the world to me that she extended her care, long after it was a matter of duty. It is difficult to find someone as intelligent, engaged, conscientious, committed, and caring. I am enthusiastic about future opportunities together, both as colleagues and as friends.

I would like to express gratitude for many other SMU associates for various supports over the years, including Dr. Marc Patry and Dr. Nicole Conrad as Department Chairs since Vic; Dr. Mark Fleming for guidance, attention, and support, both during his courses and in other roles; Dr. Lori Francis and Dr. Debra Gilin for their support as Graduate Program Coordinators; Dr. Nicolas Roulin and Dr. Veronica Stinson for research and ethics support; and my undergraduate professors who paved the path to my professional life. Also, I offer sincere well wishes to all my classmates and look forward to future encounters.

Along with my gratitude toward SMU, I extend my sincere thanks to the Canadian Forces and the Royal Military College in Kingston, ON, for their ongoing support of my professional development since Masters. Special thanks to Dr. Sarah Hill for her dedication, guidance, and support as a committee member during my MSc thesis and PhD dissertation and to Dr. Allister MacIntyre for being my external examiner during both defences. Your time, longstanding commitment, and interest in my work are very much appreciated. I am eager to continue our wonderful relationship, which brings me great pride and joy.

To my mom, Ann, thank you for being my greatest cheerleader. You would do anything in your power to support my dreams. I will always remember your words of wisdom that got me through many challenging times. I love you and appreciate the endless love and care you offered me every step of the way. Thanks also to my brothers, Jimmy and Leo, for always supporting me and believing in me. I hope I make you proud.

To my dad, Jamil, who has watched over me from the best seat in The Universe since the near end of my first year at SMU. I promised then that I would do my best to make him proud. Dad always believed in me and was extremely proud of how well I did in my first semester. I love you, dad, and will continue to strive for excellence in your honour.

To my mother-in-law, Wanda, thank you for your endless support, continued belief in me, and many cheers of encouragement and praise all along the way. You have always believed in me. I love you and look forward to many joyous new traditions ahead.

To my many family members, in-laws, and numerous special friends, I truly appreciate your immeasurable support. You have cheered for me for years, supported me, embraced me, and loved me for me. Without you, I know this journey would have been far less exhilarating, and overcoming the challenges would have felt far less fulfilling and rewarding. I cannot thank you all enough and look forward to reconnecting with each one of you. Special shout-outs go to my very special cousin, Donna, and best friend since grade school, Janet, among many others who truly are special to me, far too many to name, but you know who you are, near and far, all around the globe.

Glenn Hughes must be thanked for his magical role in my wonderful journey – his Glennergy! Because of Glenn, I have a whole other world of buds inspiring me to believe that there's a bit of rock star in us all. I look forward with excitement to magical adventures ahead. Ah, it's all good... and the best is yet to come.

To my life partner, Chris, it is hard to believe that this moment has arrived for me. It would not have been possible without you by my side. We've dreamed of something like this together since we were just teens. It is amazing. I promise to keep pushing with great determination to keep making our dreams come true as you do your part to find your way to this place. Know that I will be ready to greet you when you get here and will be standing proudly and eagerly as we welcome this purposeful future of our dreams. I love you and will always be here for you no matter what it is you want or need.

I dedicate this dissertation to my boys, Tyler and Kyle, my greatest teachers. I love you more than anything in the world and want nothing but the best for you. My dream for you is that you seek to be your best selves so that you can give back your best. May you thrive with curiosity, determination, and harmonious passion as you walk the paths of your dreams. May you always see life as a magical adventure that sets your souls a little more free.

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Study 1 – An Exploratory Analysis of Peak Performance

Determining the best way to conceptualize, measure, predict, and manage job performance is one of the most important and longstanding challenges that most organizations face (Adler, Hewitt, Campion, Colquitt, Lilly, Grubb, Murphy, Ollander-Krane, & Pulakos, 2016; Catano, Wiesner, Cronshaw, & Hackett, 2015; Highhouse, 2008; Murphy, 2008; Pulakos, Hanson, Arad, & Moye, 2015; Pulakos & O'Leary, 2011a, b; Taylor, 1911). For most of its history, job performance had been conceptualized and treated simply as observable job tasks (Campbell, McCloy, Oppler, & Sager, 1993). Only in recent decades has focus broadened to consider a multidimensional perspective. However, the approach to date has been disjointed and incomplete, resulting in a lack of practical measures, models, and management strategies (Bartram, 2005). The current study attempts to address the conceptual and measurement gaps in the performance literature by examining the conception and measurement of *peak performance* (Hays, 2009; Kimiecik & Jackson, 2002; Privette, 1981, 1984, 1987) and its relation to the following job performance triad of factors that are common in the literature: *task performance* (Borman & Motowidlo, 1997; Williams & Anderson, 1991); *organizational citizenship behavior* (Borman & Motowidlo, 1997; Williams & Anderson, 1991; Dalal, 2005; Dunlop & Lee, 2004); and *counterproductive work behavior* (Dalal, 2005; Dunlop & Lee, 2004).

Job performance has been valued and explored formally since the days of industrialism and scientific management (Taylor, 1911), but gaps in our understanding still exist. The current study addresses those gaps by broadening the job performance domain to include peak performance. A more broadly-defined approach includes relevant

performance activities that largely have been overlooked in typical workplace settings. Specifically, peak performance is characterized as a job performance style that represents exceptional/optimal performance, compared to standard/expected or counterproductive elements of performance described in the organizational literature (Hays, 2009; Kimiecik & Jackson, 2002; Privette, 1981). However, peak performance has been isolated to particular workplace settings, such as sports, performing arts, high-reliability industries, and motivational or personal-development coaching (Hays, 2009; Krane & Williams, 2006; Robbins, 2020). Only in recent years has the concept regained interest for consideration in typical workplace settings.

To date, empirical studies and/or practical applications of peak performance concepts appear to be non-existent or, at least, not explicitly apparent in the organizational literature or in typical workplace settings. If we have been attempting to address counterproductive work behaviors because of their costly and detrimental impact on workplaces (Dalal, 2005; Dunlop & Lee, 2004), then we also should include exceptional behaviors because of their potential benefits to organizations (Hays, 2009; Krane & Williams, 2006). Therefore, the current dissertation sought to address what has been missing from the job performance literature (i.e., peak performance), potential explanations for why it has been absent, or not explicitly present, and rationales for why it is vital to start considering its importance. Ultimately, the goal of this dissertation is to clarify the meaning, measurement, and merit of peak performance, in order to support its establishment in workplace settings.

Historical Overview of the Job Performance Domain

Until fairly recently, the job performance literature mainly focused on the tasks that are required to be performed for a given job (Bartram, 2005; Campbell et al., 1993).

Specifically, *task performance* looks at job-related tasks/behaviors that are directly or indirectly associated with the organization's fundamental operations and then assesses the degree of effectiveness of those behaviors (Borman & Motowidlo, 1997). Over time, theorists continued to broaden the concept of job performance to include *organizational citizenship behavior*. These refer to discretionary workplace behaviors that are not directly job-related, although they have a notable impact on organizational effectiveness and are considered important. Examples include being courteous and helpful toward colleagues (Borman & Motowidlo, 1997).

Based on a meta-analysis using latent variable path analysis and 361 studies, task performance and organizational citizenship behavior are considered related but distinct (Hoffman, Blair, Meriac, & Woehr, 2007). Specifically, organizational citizenship behavior is a better predictor of altruism, courtesy, civic virtue, conscientiousness, and sportsmanship compared to task performance (Hoffman et al., 2007). Furthermore, all of the big-five personality factors are better predictors of citizenship behaviors compared to task performance, but cognitive ability is a better predictor of task performance compared to citizenship behaviors (Chan & Schmitt, 2002). Demonstrating that task performance and organizational citizenship behavior have differential predictors and outcomes helps to establish the distinctiveness of the two related performance styles.

Variations of task performance emerged in the 1980s. Specifically, *typical performance*, *maximal performance*, and *performance variability* were explored but subsequently abandoned, until recently (Barnes & Morgeson, 2007; Marcus, Goffin, Johnston, & Rothstein, 2007; Sackett, 2007; Sackett, Zedeck, & Fogli, 1988). Typical performance refers to the standard style in which one performs a given task, whereas maximal performance refers to the maximal effectiveness level at which one performs

various work tasks (Sackett et al., 1988). Typical performance and maximal performance were treated as separate performance factors, as was the difference between the two, because the difference was thought to vary across performers (Barnes & Morgeson, 2007; Sackett et al., 1988). However, the concepts are not supported empirically in the literature. The concept of *peak performance*, or optimal performance, also formally emerged around that time, but the main focus was on psychological concepts in relation to sports (Privette, 1983; Privette & Landsman, 1983; Ravizza, 1977). Peak performance resembles the concept of maximal performance. One's maximum effectiveness, however, may not correspond to the best possible demonstration of a task; as in, an individual's best possible try is not necessarily *the* most superior demonstration possible for the given task. Peak performance represents the best demonstrations of a task across all demonstrations of human potential.

Interest in generalizing the concept of peak performance to broader settings was not widely adopted, although attempts to understand individual characteristics of performers themselves had begun to take shape in sport, social, and personality psychology research (Garfield, 1986; Privette, 1983, 1984; Ravizza, 1977; Schulz & Curnow, 1988). For instance, peak performance resembles the concept of flow introduced by Csikszentmihalyi (1975a, b, 1990, 1997). Flow refers to a psychological state of fun and joy, intense concentration, loss of self-consciousness, distorted sense of time, intrinsic desire, effortlessness, and task control, as if in a 'zone' or lost in the moment (Csikszentmihalyi, 1990, 1997; Ullén, de Manzano, Almeida, Magnusson, Oedersen, Nakamura, Csikszentmihalyi, & Madison, 2012).

Flow resembles the profile type that is related to a peak performer and, therefore, has a history of being studied in relation to peak performance (described in the next

section). The main difference is that flow is a mental state and peak performance is a behavior-based outcome of a mental state. As such, peak performance may require a state of flow, but a state of flow may not necessarily result in a peak performance. By definition, a peak performance is an incidence of superior functioning; conversely, flow may be more about automatization of a desired task that does not necessarily result in superior execution. In fact, flow can even hinder effective performance, as it can resemble addiction-like fixations that can interfere with attendance to important elements of a peak performance (Csikszentmihalyi, 1992).

In general, interest in understanding job performance had expanded from understanding job tasks to understanding the job incumbents themselves, resulting in competency-based models (Campbell et al., 1993). For example, Campbell et al. (1993) delineated job-specific task proficiency, non-job-specific task proficiency, written and oral communication proficiency, demonstrating effort, maintaining personal discipline, facilitating peer and team performance, supervision and leadership, and management and administration. On the other hand, other researchers focused on segregating role behavior into job, career, innovator, team, and organizational role behaviors (Welbourne, Johnson, & Erez, 1998). Thereafter, a combination of the two approaches emerged, whereby Johnson (2003) described task performance in a similar fashion as Campbell et al. (1993) and distinguished it from *citizenship performance* (i.e., conscientious initiative, personal support, and organizational support) and the recently popularized *adaptive performance* (Johnson, 2003; Pulakos, Arad, Donovan, & Plamondon, 2000). Examples of adaptive performance include demonstrating creative problem solving; managing uncertain/unpredictable work scenarios; acquiring new skills, procedures, and technologies; demonstrating interpersonal, cultural, and physically-oriented adaptability;

and handling work stress, emergencies, and crises (Pulakos et al., 2000; Pulakos, Schmitt, Dorsey, Arad, Hedge, & Borman, 2007). Its distinctiveness has been established (Pulakos et al., 2007).

Meanwhile, other researchers examined *proactivity*, *personal initiative*, and *taking charge* styles of performance (Crant, 2000; Frese & Fay, 2001; Morrison & Phelps, 1999; Parker, Williams, & Turner, 2006), along with other supportive workplace behaviors, including helping behavior, sportsmanship, organizational loyalty, organizational compliance, individual initiative, civic virtue, and self-development (Podsakoff, MacKenzie, Paine, & Bachrach, 2000). However, Griffin, Neal, and Parker (2007) argue that, although job performance dimensionality has been examined extensively, no comprehensive theoretical framework exists for differentiating and integrating individual performance behaviors in various contexts and linking them to effectiveness. In response, Griffin et al. (2007) developed a taxonomy that includes proficiency, adaptivity, and proactivity measured across employee behaviors on individual tasks, behaviors as a team member, and behaviors as an organization member.

It was not until around the turn of the century when researchers formally began to consider the impact of *counterproductive work behavior* on organizational effectiveness. Counterproductive work behavior refers to intentional behavior that is incongruent with, or even harmful to, organizational interests, goals, missions, and employees (Dunlop & Lee, 2004). They can range from barely noticeable (e.g., rare absences) to outright destructive (e.g., large-scale embezzlement; Dalal, 2005). Counterproductive behaviors are related negatively to citizenship behaviors (Dalal, 2005). Furthermore, distinct antecedents of each have been confirmed, suggesting conceptual differences between the two constructs, rather than simply a difference in degree of a unidimensional concept

(Dalal, 2005). Due to the potential destructive and damaging nature of counterproductive work behaviors, understanding how to assess and predict their occurrence has become a common inclusion in contemporary job performance research.

Overall, considerable research has been completed in the area of job performance dimensionality. The scope of research has focused on variations of standard/expected workplace performance to, more recently, counterproductive performance. In general, evidence supports the distinctions among the commonly measured job performance triad containing task performance, organizational citizenship behavior, and counterproductive work behavior. Additionally, whether directly or indirectly, the performance distinctions occur in workplace settings, are observable, and have an influence on organizational functioning and effectiveness (Borman & Motowidlo, 1997; Dalal, 2005). However, the literature to date contains gaps when considering the full range of potential elements of job performance. Although peak performance is considered a relevant construct in related fields, empirical studies of peak performance in relation to common workplace metrics seem to be absent. Perhaps we believe we have been measuring peak performance when we seek top performers using our current measures. However, the conceptual literature characterizing peak performance and observations of peak performers appear to demonstrate differences in kind rather than degree. Therefore, the current study addresses the viability of peak performance as a unique performance style that should be established in typical workplace settings. The study is the first known empirical examination of peak performance in relation to known performance constructs in organizational contexts.

Peak performance represents exceptional/optimal performance and broadens the current job performance domain beyond expected/standard and counterproductive performance elements. Understanding the nature of a more inclusive set of work

behaviors supports initiatives aimed at performance management. With the advent of artificial intelligence in increasingly broader workplace settings, striving for infallibility is becoming commonplace in traditionally unforeseen ways (Makridakis, 2017). A focus on fitting employees in suitable roles that optimize their capacity and desire to peak perform is a considerably viable humanistic way of addressing workplace gaps in our continuously changing world of work (Garfield, 1986; Maslow, 1943; Privette, 1983; Privette & Bundrick, 1991; Thornton, Privette, & Bundrick, 1999).

Historical Overview of Peak Performance

Peak performance is a performance style that falls under the broader term of performance psychology, a branch of psychology that focuses on improving the ability of individuals, teams, and groups to achieve their goals (Hays, 2009). The approach engages performers by directing them on methods for success through developing mental power and having performers practice mental skills in everyday life (Hays, 2009). Peak performance, in particular, refers to an incidence of superior functioning, or optimal performance, resulting from the superior use of human potential (Privette, 1981). It involves accessing latent powers required for performing optimally in a specific event (Kimiecik & Jackson, 2002). Literature formally addressing peak performance emerged in the late 1970s and initially focused on sports (Garfield & Bennett, 1984; Hanin, 1978; Privette, 1981; Ravizza, 1977). Early work described the nature of peak performances and the factors that enable top performers to produce peak performances (Garfield & Bennett, 1984; Privette, 1981; Ravizza, 1977). Researchers studied various factors related to sports performance, most notably being the role of anxiety (Hanin, 1978).

Garfield, a prominent sports psychologist and sports writer, coauthored a book outlining mental training techniques of Russian and Eastern European athletes. The book

includes peak performance training exercises that can be adopted for improving one's own performance (Garfield & Bennett, 1984). Other attempts were made to develop a sport-specific model and metric (Vealey, 1986). By the end of the 1980s, researchers studying elite athletes had examined the role of peak performance across a variety of factors and sports, including age, biology, and learning history of track and field, swimming, baseball, tennis, and golf athletes (Schulz & Curnow, 1988). During the 1990s, researchers continued to conceptualize peak performance and characterize peak performing athletes before shifting toward model and training program development (Jackson & Roberts, 1992). During the mid and late 1990s, research focused on mental-skills training (Gould & Damarjian, 1998) and on sources of confidence in sports (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Meanwhile, the *individual zones of optimal functioning* model was formed in the early 1970s by Juri Hanin and has been used widely since (Ruiz, Raglin, & Hanin, 2017).

The Individual Zones of Optimal Functioning Model

In the early 1970s, the individual zones of optimal functioning model emerged, which focused on an idiographic approach to understanding athletic performance (Hanin, 1995, 2000a, 2000b, 2000c; Hanin & Stambulova, 2002; Murphy, 1997; Ruiz et al., 2017). Rather than theorizing or seeking findings that generalize to others, idiographic approaches have an individual focus and emphasize unique personal experiences (Ruiz et al., 2017). The model posits that skilled athletes are aware of their pre-competition anxiety and can recollect and anticipate it accurately. Furthermore, each athlete has an optimal zone of pre-competition anxiety that determines the athlete's success, and performance deteriorates when pre-competition anxiety falls outside the optimal zone (Ruiz et al., 2017). The model has been applied to understanding performance anxiety

(Annesi, 1998; Hanin, 1989, 1995); for assessing emotions and how athletes feel about their performance (Hanin, 1997, 2000a, 2000b, 2000c; Hanin & Syrja, 1995; Robazza, Pellizzari, & Hanin, 2004); and for psychologically preparing athletes for peak performances using cognitive-behavioral techniques (Hardy, Jones, & Gould, 1996; Meyers, Whelan, & Murphy, 1996). The model and its applications are described in detail in a historical overview offered by Ruiz et al. (2017) that spans from 1978-2014.

Jokela and Hanin (1999) conducted a meta-analysis of 19 studies of the individual zones of optimal functioning model. The studies were from 1978 to 1997 and contained 146 effect sizes based on data from 6387 participants. They tested the validity of the 'in-zone' requirement for optimal performance and the accuracy of recollections and anticipations of pre-competition anxiety. Both premises were supported empirically. Cohen's *d* for overall effect size for the in-zone aspect was $d = 0.44$ (41 effect sizes, $n = 3175$; Cohen, 1992). In-zone athletes performed almost half a standard deviation unit better than non-in-zone athletes. As per Cohen's (1992) guidelines, effect sizes were medium to large, for both recollections ($d = 0.71$, 24 effect sizes, $n = 369$) and anticipations ($d = 0.69$, 81 effect sizes, $n = 2843$) of pre-competition anxiety.

In relation to workplace settings, the pre-competition anxiety appraisal component of the individual zones model is similar to the work on core self-evaluations, which include generalized self-efficacy, self-esteem, neuroticism, and locus of control (Judge, Locke, & Durham, 1997). Core self-evaluations are related to self-reported task motivation, persistence, self-set goals, goal commitment, and activity level (Judge, Bono, & Thoresen, 2002). Core self-evaluation traits correlate with job performance at $r = .23$, which is consistent with the relationship between conscientiousness and job performance (Judge et al., 2002). Meta-analysis results confirm the strength of the relationship

between core self-evaluation traits and job satisfaction and performance (Judge & Bono, 2001). The core self-evaluations framework has been applied successfully for understanding and predicting life satisfaction (Judge, Bono, Erez, & Locke, 2005); job stress and burnout (Brunborg, 2008); economic success (Judge & Hurst, 2007); effectiveness and performance of teams (Tasa, Sears, & Schat, 2011); work-family enrichment (McNall, Masuda, Shanock, & Nicklin, 2011); and creativity (Zhang, Sun, Lin, & Ren, 2020). The model is well supported and is applied broadly and successfully (Kanfer, Freese, & Johnson, 2017). The components of the model appear to be relevant to the pre-competition anxiety and performance components of the individual zones model.

In relation to typical industries, the in-zone aspect of the model also resembles the growth needs score identified by Hackman and Oldham (1976) as part of their job characteristics theory. The job characteristics theory was one of the first empirically-driven theories of person-job fit and the first to address interactions between job design and individual differences in motivation to perform (Koppes & Vinchur, 2012). Establishing the growth needs score as a performance moderator showcased the role of work stressors on commitment and performance (Mathieu & Zajac, 1990); the impact of job enrichment on job perceptions and satisfaction (Wong, Hui, & Law, 1998); and of job characteristics on selection and placement (Kristof-Brown, Zimmerman, & Johnson, 2005). A considerable body of research supports the theory, which is used widely to date (Allan, Batz-Barbarich, Sterling, & Tay, 2018; Fried & Ferris, 1987; Gajendran & Harrison, 2007; Latham & Pinder, 2005; Spector, 1986; Ter Doest & De Jonge, 2006).

Overall, the relevance of considering peak performance in typical workplace settings is supported by the findings for a widely-used sports model of athletic peak performance and the fundamental similarities between the model and traditional

organizational models and concepts. In other words, the concepts outlined for athletes are parallel to concepts supported in traditional organizational literature – certain individuals are more suitable for certain roles that land them in the 'in-zone', thereby optimizing their performance. The literature suggests this is true of sports roles (i.e., the individual zones model) as well as of typical work roles (i.e., the job characteristics theory and core self-evaluations approach).

Peak Performance in the New Millennium

Into the 2000s, the nature and characteristics of pre-competition and general affect of elite athletes continued to be the research focus (Harmison, 2005, 2006; Robazza & Bortoli, 2003; Robazza, Bortoli, & Hanin, 2004; Robazza, Bortoli, & Nougier, 2002). Research also was conducted with Olympic athletes and their coaches in order to identify the factors that distinguish average performance from superior performance (Gould, Greenleaf, Guinan, & Chung, 2002; Gould, Guinan, Greenleaf, Medbury, & Peterson, 1999; Greenleaf, Gould, & Dieffenbach, 2001). While motivation theories were gaining traction in the organizational literature and in practice, such as the job characteristics theory or core self-evaluations approaches, psychological skills training and goal-setting activities were being applied to sport psychology. The emphasis was on personal growth as a means of becoming a peak performer, such as improving concentration, resilience, and emotional regulation (Gould, 2006; Harmison, 2006; Nideffer & Sagal, 2006; Ravizza, 2006; Weinberg & Williams, 2006; Wilson, Peper, & Schmid, 2006; Zinsser, Bunker, & Williams, 2006). Based on training program content, a peak performer in sports came to be related to a certain profile type, which is characterized as follows: feeling high levels of self-confidence and expectations of success, being energized and yet relaxed, feeling complete levels of concentration, feeling in control, being keenly

focused on the task at hand, thinking about performance with a positive attitude, and having high levels of determination and commitment (Krane & Williams, 2006).

In recent years, various books have been published to address peak performance in sports, music performance, and executive-level management (addressed in the next section). For instance, Brady (2017) released a book for personal use, in which he outlines the TB12 method. TB12 is his own personal holistic approach to excellence as a quarterback for the New England Patriots and a multiple Super Bowl champion. Bubbs (2019) authored a book outlining the science behind peak athletic performance to address the disconnection between evidence-based techniques in the literature and in professional practice compared to the reality of how athletes actually practice. Bubbs's (2019) book applies empirical research to addresses the confounding nature of social media, outdated practices, and common advice on optimal performance. The approach emphasizes the fundamentals of high performance over fads, the importance of consistency over extreme effort, and the value of patience over rapid transformation.

Regarding peak performance and music, Marotto, Roos, and Victor (2007) studied the elements that contribute to the collective peak performance of an orchestra – a workgroup comparable to a sports team in terms of the requirement for collaboration. They describe how individual virtuosity, or peak performance, becomes collective through a reflexive process that transforms a group's performance and offer a theoretical model to achieve such an outcome. Cornett's (2019) book applies the mental skills of peak performers to improving musician performance at the individual level. The book focuses on building resilience by cultivating artistic vision, objectivity, quiet awareness, self-compassion, and freedom. It is the first book to combine mindfulness practices with cognitive and sport psychology research to promote attentional focus, self-assessment,

emotional awareness, and creativity by exploring the roots of performance anxiety through deliberately focusing on awareness (Cornett, 2019). Overall, the expansion of peak performance into broader areas, including traditional workplace settings (discussed in an upcoming section), supports its need for empirical validation.

Peak Performance in Social, Personality, and Humanistic Psychology

While formal interest in peak performance was emerging in sport psychology, social and personality psychology researchers became interested in the relationship between peak performance and constructs such as peak experiences (Privette, 1983; Ravizza, 1977) and flow (Privette, 1983). For instance, an early study compared positive human experiences to identify their uniqueness. The study included peak experience, defined as intense joy; peak performance, defined as superior functioning; and flow, defined as an intrinsically rewarding experience (Privette, 1983). The study revealed similarities with respect to absorption, valuing, joy, spontaneity, a sense of power, and personal identity and involvement. Regarding differences, peak experience was described as mystic and transpersonal; peak performance was considered transactive, self-focused, and object-focused; and flow was characterized as fun (Privette, 1983).

Throughout the 1980s, more attention was given to measuring peak performance and related constructs. One promising study involved identifying the characteristics of peak performances, which were defined as behaviors that surpass what would be considered probable or predictable (Privette & Landsman, 1983). The study involved ninety participants, from 16 to 65 years of age, enrolled in college introductory psychology, creative arts, and adult education classes. Participants completed a questionnaire that involved narrating and rating instances of peak performances. Trained judges evaluated the narratives and ratings were factor analyzed. Using *t* tests and

discriminant function analysis, peak performance was shown to be a uniquely identifiable multidimensional psychological construct. The factors that emerged include clear focus, intense involvement, intention, and spontaneous expression of power, but psychological involvement with others was not considered important to their peak performance (Privette & Landsman, 1983). Involvement with others might be considered more important to participants, if they were asked to provide narratives involving team effort, such as in sports. Although the study appears to be the first attempt at understanding peak performance in more general settings, beyond sports, the work and concept of peak performance was mainly descriptive in nature.

Following the Privette and Landsman (1983) study, Privette and Bundrick (1987) validated Privette's (1984) experience questionnaire, which was developed based on experiential correlates of peak experience, peak performance, and flow found in the literature. Participants were 42 male and 81 female advanced and graduate social sciences and communications arts students. They reported diverse occupational interests, including science, social services, business and technology, military, education, arts and humanities, and sports. Participants were asked a 'construct event primer' question for each of six construct events (i.e., peak performance, peak experience, flow, average event, misery, and failure). They then were asked to narrate a personal experience, as follows: for peak performance, describe 'one incident in your life characterized by functioning at your best'; for peak experience, describe 'one incident in your life characterized by highest happiness'; for flow, describe 'the last time you played a sport or game'; for an average event, describe 'something you did between 3:00 p.m. and 6:00 p.m. yesterday'; for misery, describe 'one incident in your life characterized by deepest misery'; and for failure, describe 'one incident in your life characterized by total failure'. After providing

a narrative for each construct event primer, participants completed 47 items on a Likert scale that factored into eight factors: self in clear process, full focus, significance, fulfillment, spirituality, other people, play, and outer structure. As the researchers intended, the various construct events corresponded with the respective factors, providing evidence of the face and construct validity of the various feelings and performance variables being measured by the construct events (Privette & Bundrick, 1987).

A study published a few years later asked a fairly small number of participants to rate the importance of each item in a series, after describing one of the following personal experiences: peak performance, peak experience, flow, an average event, misery, or failure (Privette & Sherry, 1986). Item-level descriptive statistics and reliability coefficients were reported, but no clear purpose or directions were offered. Meanwhile, Garfield (1986) wrote a book specifically about peak performers. The book was inspired by decades of observations and fascination with what makes some individuals strive to become peak performers. He observed the presence of peak performers in all fields, including sports, science, arts, entertainment, executives, street performers, etc. He concluded that peak performers are made, not born; they are committed to success, rather than being workaholics; they are average individuals, not super-humans with special talents; and they share common attributes that can be cultivated. As such, peak performance is selectable and trainable (Catano et al., 2015; Garfield, 1986).

Around that time, Privette and Bundrick (1987) further developed the experience questionnaire. Experiential data were obtained from 123 adults who reported events that needed to include positive and negative experiences that were accessible, salient, and independent. Events included peak performance, peak experience, flow, average events, misery, and failure, as before. Findings for each of the event categories were as follows:

peak performance was characterized as having full focus and visualizing oneself in a clear process, with the role of others as being unimportant. Peak experience represented fulfillment, significance, spirituality, and the importance of others. Flow consisted of play, others, and outer structure but excluded spirituality. Average events contained outer structure but lacked full focus. Misery included spirituality and significance but lacked others, playfulness, and self in clear process. Failure included spirituality but not fulfillment (Privette & Bundrick, 1987).

Using the experience questionnaire in a follow-up study of data from 123 college students, Privette and Bundrick (1991) assessed the salience, uniqueness, and common characteristics of peak experience, peak performance, and flow. All three were considered to be independent, salient experiential events. Overall, personal experiences resembled descriptions in the literature. In particular, peak experiences comprised fulfillment, significance, and spirituality. Peak performance involved full focus, self in clear process, and a unique distinction of optimal performance compared to other events. Flow included play, outer structure, and the importance of others (Privette & Bundrick, 1991). Overall, Privette and colleagues completed a variety of studies on peak performance and peak experiences, both in sports and in typical workplace settings. As a whole, the work remained mainly descriptive in nature through various demonstrations of the uniqueness of the constructs using narratives of personal life events. Although the work was conducted from the context of social and personal events, the body of work inspires a similar exercise to be applied to workplace constructs and events.

The Emergence of Peak Performance in Traditional Workplace Settings

Around the turn of the millennium, interest in peak performance had renewed across a variety of fields, industries, and work roles. Various researchers since have

borrowed the concept of peak performance from sports to consider its role in standard workplace settings (Hays, 2009; Hays & Brown, 2004; Ievleva & Terry, 2008; Jones, 2002; Loehr & Schwartz, 2001; Privette, 2001). For instance, Thornton, Privette, and Bundrick (1999) investigated the parallel conception of peak performance of business leaders and self-actualization. Later, Hays (2009) compiled case studies of numerous investigations into peak performance across various fields. The book is a compilation of diverse applications of performance psychology across sports, performing arts, business, and high-risk occupations. It includes, for example, skills training for enhancing performance (Andersen, 2009); treatment of consultants as performers (Brown, 2009); and addressing confidence (Gould, 2009). As opposed to a 'how-to' book for general use, it illustrates the application of performance psychology principles across various cases by describing client assessments and actions taken in each particular case (Bianco, 2010).

Over the past decade, interest in establishing peak performance in workplace settings has continued (Conley, 2017; Gattorna, 2016; Hallett, 2011; Hallett & Hoffman, 2014). Hallett (2011) developed a peak performance training program based on the premise that peak performance requires accessing knowledge and skills successfully while under pressure. Variance in this ability exists, even when controlling for biological factors, motivation, and external constraints (Brown, 2009), which was the basis for the program's development. The program was assessed by business professionals who reacted favorably to the training content, design, activity variety, and applicability, but unfavorably to the duration, comprehension of concepts, materials, and utility. Hallett and Hoffman (2014) then conducted research on cultivating a peak performance mindset to manage performance while under pressure (e.g., fear of criticism, high expectations, concern over negative judgments from others, and personal beliefs). They believed that

pressure is inherent to many work roles; many individuals fail to perform well even when motivated; and the ability to perform exceptionally while under pressure can be learned. Based on the effectiveness of training transfer in sports psychology, they offer organizational coaches and consultants a framework for peak performance training in typical workplace settings (Hallett & Hoffman, 2014).

In recent years, various books have been published to improve peak performance at the organizational level. For instance, Gattorna (2016) focuses on dynamic supply chain alignment to address the shortcomings of old conventions in the modern world of volatile and increasingly unpredictable demand and supply. Meanwhile, Conley (2017) applies Maslow's (1943) hierarchy of needs theory as the basis for the PEAK strategy outlined in his book. The main premise is organizations peak perform when leaders become amateur psychologists who apply the needs hierarchy to better understand the unique needs of each of their employees, customers, and investors (Conley, 2017). The idea is that heightened leader performance translates to peak effectiveness of the overall organization. The focus is similar to the individual consideration aspect of transformational leadership (Bass, 1985; Burns, 1978), an important organizational psychology construct that has been studied more than all other leadership theories combined over the last century and beyond (Judge & Bono, 2000). With respect to leadership, transformational leadership arguably is synonymous with a peak leadership performance. Maslow's (1943) theory has been clarified and modified to include cognitive and aesthetic needs (Maslow, 1970a) and transcendence needs (Maslow, 1970b), which further enhances its theoretical applicability to peak performance and transformational leadership.

Maslow's (1943) theory influenced a variety of motivation theories that followed (Adams, 1963; Deci & Ryan, 1985; Hackman & Oldham, 1976; Latham & Pinder, 2005; Locke, 1968; McGregor, 1960; Vroom, 1964). It has been applied to corporate management training, theory, and practice (Lussier, 2019), and in a variety of other ways (Baumeister & Leary, 1995). For instance, it has been used to reduce physician burnout and improve well-being (Shapiro, Duquette, Abbott, Babineau, Pearl, & Haidet, 2019); for palliative care outcomes (Zalenski & Raspa, 2006); to counsel refugees (Lonn & Dantzler, 2017); and for American stock market portfolio selection (Li, Chen, & Hui, 2018). Furthermore, Maslow's (1943) work is relevant across time, discipline, and culture due to its cross-disciplinary recognition and major impact on humanistic and personality psychology (Schultz & Schultz, 2013). Linking peak performance to Maslow's (1943) theory and to leadership development (Conley, 2017) provides relevance to developing peak performance in typical workplace settings. Overall, with the ever-changing and competitive nature of workplaces, the concept of peak performance appears to have intuitive and industry appeal, particularly due to its well-established roots in performance and sport psychology, its trainability, the success of training transfer in sports, and its broader applicability to organizational constructs and typical workplaces.

Although the concepts underlying performance psychology and peak performance have been supported empirically, evidence is case-specific, domain-specific, or generally descriptive in nature (Hays, 2009). However, Schmidt and Hunter (1977) determined that the main causes of variable findings across jobs and settings were due to sampling error and other statistical artifacts. Although the Schmidt and Hunter (1977) findings are dated, sport psychology as a unique discipline has existed for over a century (Kornspan, 2007). This paradoxically implies that the psychology of sport performance is unique, if the

concept of peak performance typically has not been generalized to organizational settings. However, consulting and organizational professionals are adopting the concepts of performance psychology and peak performance increasingly and more globally across industries (Bianco, 2010; Hays, 2009), which justifies its empirical examination in relation to traditional job performance constructs in the organizational literature. Given its characterization as exceptional performance, peak performance is expected to relate to task performance and organizational citizenship behavior positively and to counterproductive work behaviors negatively.

The Current Conception of Peak Performance

The current study considers peak performance a performance style capable of existing in seemingly ordinary settings, because it is due to a special kind of fit between the individual and the work or industry's culture that invokes a peak performance (Garfield, 1986; Hackman & Oldham, 1976). Not everyone deeply wants to be a star athlete or entertainer, but there is something (or several things) of particular interest to each individual in which they would do exceptionally well, if given the appropriate opportunities and circumstances (Maslow, 1943, 1970a, b). This essentially resembles Maslow's (1943) conception of self-actualization, which historically was applied primarily to high-profile roles. More broadly applied, however, the current study proposes that each individual, if given the opportunity to shine in their area of deep interest, could be capable of peak performing in that area (Garfield, 1986). As such, the current study proposes that peak performance is both latent (i.e., implicit attraction to a given task) and trainable (i.e., mastery of a given task) and comprises attributes (i.e., interest/desire/self-confidence) and behaviors (i.e., opportunities to demonstrate performance; Garfield, 1986; Maslow, 1943, 1970a, b; Hackman & Oldham, 1976).

The current study defines peak performance as exceptional or optimal performance of work tasks by an individual who highly desires and fits the work or industry culture, leading to dedication to achieving an exceptionally high level of excellence in performance (Garfield, 1986; Maslow, 1943, 1970a, b; Hackman & Oldham, 1976). A peak performer engages in consistent strategic execution of expertise developed through desire, devotion, and practice (Garfield, 1986). Peak performers feel high levels of self-confidence and expectations of success; they are energized and yet relaxed; they feel complete levels of concentration and control; they have a keen focus on the task at hand; they think about performance with a positive attitude; and they have high levels of determination and commitment (Krane & Williams, 2006). These qualities are seen in entertainment or sports, for example, where precisely executed orchestras or top athletes predictably perform impeccably well each time they execute a task. They manifest the gold standard of performance through superior use of human potential (Privette, 1981).

Although a performer may have the expertise to perform exceptionally well (i.e., 'can do'), it is a particular fit that the performer has with the work that makes their performance impeccable (i.e., 'desire to do'; Krane & Williams, 2006). This can be seen in star athletes and other exceptional performers, such as musicians, as well as in typical workplaces (e.g., being told that, "There aren't many lawyers like you.", or, "This restaurant never ran this well before you got here!"; Garfield, 1986; Krane & Williams, 2006). There is a deeper level of connection and fit with the role and tasks beyond simply being trained (Garfield, 1986; Maslow, 1943, 1970a, b; Hackman & Oldham, 1976). The connection is more of a passion for the work itself, or a deep emotional bond with the role and tasks that manifests as dedication in a way that does not feel like a chore, and

learning and trying more does not feel tedious or dull. The current study is an opportunity to clarify the relevance of peak performance in a broader organizational context.

The Current Research

Three studies were conducted to establish that peak performance can, and should, be measured in organizational settings. In Study 1, a measure was developed and its dimensionality was assessed empirically using exploratory principal components analysis. Bivariate relationships among peak performance, task performance, organizational citizenship behavior, and counterproductive work behaviors were assessed.

In Study 2, a confirmatory factor analysis was conducted on two independent samples to confirm the peak performance scale developed in Study 1. Correlation, regression, redundancy, moderator, and relative weights analyses were conducted to demonstrate the unique construct and predictive validity of peak performance for predicting job performance outcomes.

In Study 3, the resulting peak performance scale was used in an experimental design to demonstrate the individual and combined effects of expected performance and peak performance on ratings of acknowledgement, rewardability, and promotability. As a set, the three studies develop and assess a measure of peak performance in workplace settings and establish the empirical rationale for studying peak performance as a unique component of job performance.

Study 1

The purpose of the Study 1 was to develop a non-job-specific scale of peak performance. For this research, peak performance is represented by attributes and behaviors. It is defined as exceptional or optimal performance and characterized as having high levels of self-confidence and expectations of success, feeling energized and

yet relaxed, having complete concentration and control, being keenly focused on the task at hand, thinking about performance with a positive attitude, being highly determined and committed, and demonstrating a superior use of human potential and functioning (Krane & Williams, 2006; Privette, 1981). As part of the scale development process, two hypotheses were examined.

Hypotheses

Hypothesis 1. The peak performance items represent peak attributes and peak behaviors.

Hypothesis 2. Peak performance, task performance, and organizational citizenship behavior positively inter-relate and negatively relate to counterproductive work behavior.

Method

Participants

Participants were 103 undergraduate students from Saint Mary's University who ranged from 18 to 64 years of age (M = 23.7, SD = 8.6). They varied in age, gender, and ethnicity and were required to have at least six months of work experience under the same immediate supervisor. The decision to have student participants provide ratings of supervisor performance enables the measure that was being developed to be based on reasonably complex jobs, where a variety of activities and variations in performance are more observable. Supervisor roles are presumed to be more complex than the roles that supervisors oversee. In terms of rater accuracy, employees tend to rate their own performance deficiencies reasonably accurately but tend to be positively lenient on ambiguous factors (Bernardin, Hagan, Kane, & Villanova, 1998). They may believe their optimal performance is being hindered by uncontrollable external factors (Bernardin et

al., 1998). However, for the current study, there is no particular advantage or disadvantage to inflate or deflate the ratings, because the research is not associated with any particular workplace. Therefore, student ratings of supervisor performance were considered suitable for obtaining reasonably accurate performance ratings of fairly complex jobs. Participant and supervisor demographics appear in Table 1.1.

Table 1.1

Demographicsof the Participants, Their Jobs, and Their Supervisors

Categorical Data	***N***	**%**	**Categorical Data**	***N***	**%**
Participant Gender			**Participant Education**		
Male	18	17.5	Grade school	2	1.9
Female	85	82.5	High school graduate	12	11.7
Total	103	100.0	Some college/trade/tech	5	4.9
Supervisor Gender			College/trade/tech graduate	4	3.9
Male	30	29.1	Some university	68	66.0
Female	70	68.0	University undergraduate degree	10	9.7
Unspecified	3	2.9	Some graduate work	0	0.0
Total	103	100.0	University graduate degree	2	1.9
			Total	103	100.0

Continuous Data	***Mean***	***SD***
Participant Age in Years	23.7	8.6
Participant Work Hours Per Week	20.3	13.3
Number of Years the Participant Has Known the Supervisor	3.2	4.3
Number of Years the Participant Has Worked for the Supervisor	2.0	1.8

Procedure

Participants used the SONA system to access the Qualtrics-hosted study. The SONA system is an online platform on which studies being conducted by the Psychology Department at Saint Mary's University are uploaded for students to access. Qualtrics is a company that offers online surveying services. Students familiar with SONA self-select to

view available studies in which to participate. The invitation to the current study informed students that the research study involved investigating job performance. Students were informed that the study would take 15-30 minutes and that they would receive one half of a percent bonus credit for participating, to be used toward an eligible course. Students were informed that participation is voluntary, anonymous, and able to be discontinued at any time, without penalty, by closing their internet browser. Students were informed that the study received approval from the Saint Mary's University Research Ethics Board and were provided with contact information, if they had any questions. Those who chose to participate clicked on a hyperlink directing them to the online survey package hosted by Qualtrics, which contained an informed consent form; demographic questions about themselves, their job, and their supervisor; the job performance survey items; and a final feedback statement about the study and how to obtain results (see Appendix B).

Measures

Participants were instructed to bring to mind someone who has or had been their immediate supervisor for at least six months. They then completed demographic items about themselves, their job, and the supervisor, followed by survey items representing task performance, organizational citizenship behavior, counterproductive work behavior, and peak performance. For each survey item, participants rated the degree to which the item described the supervisor they had brought to mind. All items were rated on a five-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree').

Task performance and organizational citizenship behavior. Task performance and organizational citizenship behavior were measured using a survey devised by Williams and Anderson (1991). The 21-item scale measures in-role behavior (items 1-7), citizenship behavior toward individuals (items 8-14), and citizenship behavior toward the

organization (items 15-21). For the current study, in-role behavior was used to represent task performance and all other items were aggregated to represent overall organizational citizenship behavior. Cronbach's (1951) alpha for the internal consistency reliability overall was reported as α = .83, and was α = .91 for in-role behavior, α = .88 for citizenship behavior toward individuals, and α = .75 for citizenship behavior toward the organization (Williams & Anderson, 1991). For the current study, alpha was α = .85 for task performance and α = .91 for overall organizational citizenship behavior.

Counterproductive work behavior. Counterproductive work behavior was measured with the Counterproductive Work Behavior Check (Spector, Fox, Penney, Bruursema, Goh, & Kessler, 2006). The measure assesses intentional behaviors that are harmful to individuals and organizations. The scale contains five dimensions within two larger factors directed at the individual level and organizational level: sabotage (items 1-3), withdrawal (items 4-7), production deviance (items 8-10), theft (items 11-14), and abuse (items 16-33). To reduce the number of items that the participants needed to complete, the abuse scale was excluded. Retained items were aggregated to represent overall counterproductive work behavior. Cronbach's (1951) alpha for internal consistency reliability for overall counterproductive work behavior was reported as α = .87, and as α = .85 for counterproductive work behaviors toward individuals and α = .84 for counterproductive work behaviors toward the organization (Spector et al., 2006). For the individual scales, alpha was α = .42 for sabotage, α = .63 for withdrawal, α = .61 for production deviance, α = .58 for theft, and α = .81 for abuse (Spector et al., 2006). For the current study, alpha was α = .83 for the aggregated scale.

Peak performance. Measures of peak performance tend to focus on specific incidences on exceptional performance based on objective performance data (Hays, 2009;

Kimiecik & Jackson, 2002; Krane & Williams, 2006; Privette, 1981). It has been measured in social, personality, humanistic psychology contexts as part of a larger inventory of life event-type constructs, such as peak experiences, failure, or misery (Privette, 1984). However, no known non-job-specific inventory exists for use in work contexts, which prompted the creation of the peak performance questionnaire for use in the current study (Wright, Quick, Hannah, & Hargrove, 2017).

Wright et al. (2017) published a study outlining eight best practices in test construction and validation necessary to meet the standards for publication of new measures. They include providing a theoretical basis for all items; taking time and care in the initial scale development and content validity; pilot testing the initial items; conducting item, factor, reliability, and validity analyses on the initial items; establishing the criterion validity of retained items; reporting reliability and validity coefficients; and establishing, via a test-retest method, that bias is not inherent in the final scale (Wright et al., 2017). For simplicity, a basic framework of *peak attributes* and *peak behaviors* was used when developing the peak performance questionnaire items. Content was based on theoretical descriptions of peak performance in the literature and on incidences of workplace observations across various industries and contexts.

Crocker and Algina (1986) outline guidelines for generating newly-written items, including avoiding double- and triple-barreled items, ensuring equal representation of positively and negatively worded items as a guard against response patterns such as ‘yes-saying’, avoiding the use of direct negation (e.g., the word ‘not’) that can be overlooked accidentally and result in unknowingly erroneous data, writing short and direct statements with carefully selected wording, and ensuring clear and simple instructions. For the current study, a balance of construct representation and parsimony was considered, due to

its importance for obtaining content and construct validity while avoiding redundancy and fatigue (Anastasi, 1976; Cronbach and Meehl, 1955; Schmitt & Stults, 1985). However, reduced length runs the risk of criterion deficiency, reduced internal consistency, and lowered test-retest reliability (Kenny, 1979; Nunnally, 1978), especially with single-item scales (Hinkin & Schriesheim, 1989). Overall, as few as three items can achieve adequate internal consistency (Cook, Hepworth, Wall, & Warr, 1981), with a diminishing impact on scale reliability as items are added (Carmines & Zeller, 1979).

Eleven newly-developed peak performance items were circulated to subject matter experts for refinement, including professors and graduate students in the Psychology Department at Saint Mary's University. Participants were instructed to review the items for clarity, face validity, completeness, redundancy, and overall psychometric soundness. The resulting measure to be tested contained eleven items (four attributes and seven behaviors; see Appendix A).

Data Analysis Procedure

Following data screening, univariate outlier analyses were conducted on the dataset and outliers were removed. Principal components analysis was used to test the hypothesized attributes and behaviors facets of peak performance. Cronbach's (1951) alpha for internal consistency reliability was calculated for each factor that emerged from the principal components analysis. Means, standard deviations, correlations, and Cronbach's (1951) alpha for internal consistency reliability were calculated for the scales used in the study. SPSS was used for all analyses (IBM Corp., 2020).

Sample Size Considerations During Testing

Determining sample size for conducting an exploratory analysis is a fairly complex matter. MacCallum, Widaman, Zhang, and Hong (1999) conducted a study to

assess the merits of various guidelines for sample sizes needed to conduct an exploratory factor analysis. They noted several important aspects of studies as determinants of optimal sample size. Of particular importance are the level of overdetermination of the factors and the level of communality of the variables. Highly overdetermined factors contain several items with high loadings and good simple factor structure; weakly overdetermined factors contain items with low loadings and poor simple structure. Essentially, overdetermination is a measure of the degree of criterion relevance; although complex to determine, it is best achieved when a measure has at least five times as many variables as factors (Comrey and Lee, 1992). The more likely that this has been achieved, the smaller the sample needed to demonstrate fit of the data to the model; basically, if the phenomenon actually exists, the truer the definition is to the phenomenon in reality, necessitating fewer respondents to recognize and establish its existence. High overdetermination also may reduce the impact of sampling error, making a smaller sample comparably as effective at determining fit (Arrindell & van der Ende, 1985; Barrett & Kline, 1981).

With respect to communalities, as their values become lower, the roles of sample size and overdetermination become more important. As long as factors are well-determined (i.e., a fairly small number of factors with a comparably larger number of indicators for each), communalities can be about .50 and good model fit still can be achieved with samples of 100 to 200 participants (MacCallum et al., 1999). However, consistently low communalities but high overdetermination of factors (e.g., three to four factors with six to seven items in each) can achieve good model fit with a sample of at least 100 (MacCallum et al., 1999). A combination of low communalities, few factors, and few items per factor requires a sample of at least 300 (MacCallum et al., 1999). A

combination of low communalities and weakly-determined factors requires a sample of at least 500 to demonstrate a fit (MacCallum et al., 1999). For the purpose of the current study, factor-to-item ratio with high overdetermination was achieved (MacCallum et al., 1999), making a minimum of 100 participants suitable for exploratory analyses (MacCallum et al., 1999).

Item Refinement Criteria

From a theoretical framework, two general factors were hypothesized to represent peak performance: peak attributes (i.e., characteristics of the employee) and peak behaviors (i.e., actions of the employee). Using the two-factor framework to guide theoretical considerations, four statistical criteria were used to interpret the factor analysis: total variance explained, factor reliabilities for the extracted factors, item communalities, and factor loadings. For the extracted factors to be considered acceptable for assessment, total variance explained needed to be at least 50 percent and Cronbach's (1951) needed to be least $\alpha = .70$ for each extracted factor (Nunnally, 1978). At the item level, communalities indicate the amount of variance that is shared among variables in a factor, where a communality value of less than .20 indicates that at least 80 percent is unique variance (Yong & Pearce, 2013). Factor analysis aims to explain variance through common factors (Child, 2006). Therefore, it is acceptable to eliminate variables with low communalities, because low communalities indicate high uniqueness, which is opposite of the objective of factor analysis (Yong & Pearce, 2013). For the purpose of this study, communality values of less than .20 were considered low (Yong & Pearce, 2013). With respect to factor loadings and cross-loading of items, factor loadings were suppressed conservatively to .25 or greater, due to lack of availability of other peak performance scales to guide the current process (Matsunaga, 2010). Likewise, cross-loading

discrepancy was set conservatively, to be at least .40 of a difference, for an item to not be considered ambiguous (Matsunaga, 2010).

Results

During data screening, it was evident that the theft component of the counterproductive work behavior scale produced very little variability in responses, likely due to it being difficult to observe theft directly. Therefore, the theft items were removed before conducting the analyses.

Hypothesis 1: Exploratory Analyses

Hypothesis 1 hypothesized that peak performance can be represented as a two-factor model consisting of attributes and behaviors. A principal components analysis with direct oblimin rotation was conducted to refine the 11-item peak performance measure. Two factors were extracted based on Eigenvalues greater than 1.00. Total variance explained for the two factors was 57.3%. The solution converged in four iterations. Table 1.2 shows the total variance explained and Cronbach's (1951) alpha for each extracted factor, along with the communalities and the pattern matrix factor loadings for each item, with loadings suppressed to .25 or greater.

As shown in Table 1.2, Component 1 contains all seven peak behavior items (B5 to B11) and a strong peak attributes item (4A). None of the peak behavior items cross-loaded and all factor loadings achieved acceptable levels (.39 to .83). The component explains 44.02% of the total variance and has a Cronbach's (1951) alpha of $\alpha = .87$. Comparatively, Component 2 contains three of the four peak attribute items (A1 to A3). The component explains 13.28% of the total variance and has a Cronbach's (1951) alpha of $\alpha = .65$, which is below the minimum standard of .70 for reliability.

Item 2A (i.e., ‘acts like he/she expects to be successful at work’) cross-loads, based on the set cut-offs of .25 for loading values and .40 for discrepancies between loadings across components (Matsunaga, 2010). At face value, the item appears to be broad and vague by asking respondents to rate someone else’s prediction of the future. The item also could be perceived as high self-efficacy/self-confidence, the intended characterization, or it could be misperceived as boastful/arrogant. Finally, it is unclear if the item is an attribute or behavior. Although attributes might lead to self-confidence, the expression of self-confidence is a behavior. The second problematic item, Item 4A (i.e., thinks about performance with a positive attitude’), was intended to be an attributes item but loaded onto the behavior component. Although thinking is a behavior, it is not readily clear that someone who appears to be thinking is doing so about work or with a positive attitude. After removing Items 2A and 4A, the two remaining attributes items have an internal consistency reliability of α = .52, which is considered unreliable.

Table 1.2

Exploratory Results for the 11-Item Peak Performance Measure

Communality	**Survey Items and Factor Loadings for Each Component**	**Component**	
		1	**2**
.61	1A. Acts like he/she feels high levels of self-confidence at work.		.79
.56	2A. Acts like he/she expects to be successful at work.	.27	.62
.62	3A. Acts like he/she feels in control at work.		.79
.62	4A. Thinks about performance with a positive attitude.	.82	
.57	5B. Has demonstrated superior use of human potential.	.72	
.55	6B. Has demonstrated an incidence of superior functioning.	.69	
.52	7B. Acts energized and yet relaxed at work.	.75	
.15	8B. Has demonstrated incidences of complete levels of concentration.	.39	
.73	9B. Gets keenly focused on the task at hand.	.83	
.67	10B. Acts highly determined at work.	.75	
.71	11B. Acts highly committed at work.	.82	
	Alpha (*α*)	**.87**	**.65**
	Total Variance Explained (%)	**44.02**	**13.28**

Due to the unacceptable findings for the component representing peak attributes and the strong findings for the component representing peak behaviors, a decision was made to omit the four-item peak attributes scale from subsequent analyses and to conduct an exploratory analysis on the seven behavior items alone. As shown in Table 1.3, all seven peak behavior items loaded onto a single component, with a Cronbach's (1951) alpha of α = .85. Total variance explained for the component is 55.6%. Following the initial principal components analysis, only Item 4 was removed (i.e., 'has demonstrated incidences of complete levels of concentration at work'). The item produced a very low communality compared to the communalities of the other six items (.16 compared to a range of .43 to .75 for the other items) and a comparatively low factor loading relative to the factor loadings of the other six items (.40 compared to a range of .66 to .86 for the other items). The content of the item itself may be difficult to measure. Specifically, whether or not someone is concentrating is not easy to observe or interpret in others. Someone may seem like they are concentrating, but they also could be ruminating about something completely unrelated to the work task. Although the item was intended to tap the mindfulness aspect of peak performance, it could be something that only the employee can report directly. It might not be possible to observe conclusively in others, compared to observing the quality of an outcome resulting from apparent concentration.

The removal of Item 4 alone resulted in improved and acceptable principal components analysis findings. Total variance explained increased from 55.6% to 62.8%, and reliability remained high (from α = .85 to α = .88). Table 1.3 includes descriptive statistics for the peak behavior items, along with the results of the initial seven-item principal components analysis and the final six-item analysis. The six items, therefore, represent the new peak performance scale to be confirmed during Study 2.

Table 1.3

Exploratory Results and Descriptive Statistics for the Seven Peak Behavior Items

***Mean* (1-5)**	***SD***	**Peak Behavior Items**	**All Items**		**Item 4 Removed**	
			Communality	**Loadings**	**Communality**	**Loadings**
3.39	1.09	1. Has demonstrated superior use of human potential.	.56	.75	.56	.75
3.63	1.04	2. Has demonstrated an incidence of superior functioning.	.57	.76	.56	.75
3.62	1.12	3. Acts energized and yet relaxed at work.	.43	.66	.45	.67
3.48	1.19	4. Has demonstrated incidences of complete levels of concentration.	.16	.40	-	-
3.64	1.08	5. Gets keenly focused on the task at hand.	.75	.86	.75	.87
3.73	.98	6. Acts highly determined at work.	.69	.83	.70	.84
3.97	1.00	7. Acts highly committed at work.	.74	.86	.75	.86
		Alpha (*α*)	**.85**		**.88**	
		Total Variance Explained (%)	**55.6**		**62.8**	

Hypothesis 2: Correlational Analyses

Hypothesis 2 hypothesized that peak performance, task performance, and organizational citizenship behavior positively inter-relate and negatively relate to counterproductive work behavior. Table 1.4 shows that all hypotheses were supported. All relationships are moderately to strongly positive or negative, as expected, $|r| = .49$ to $|r| = .84$, $p < .01$. Cronbach's (1951) alpha was high for all measures used ($\alpha = .83$ to $\alpha = .91$) and appears bolded along the diagonal.

Table 1.4

Bivariate Correlations, Scale Reliabilities, and Descriptive Statistics

	Task Perform	**Citizenship Behavior**	**Counter-productive**	**Peak Perform**	**# of Items**	***Mean* (1-5)**	***SD***	***N***
Task Performance	**.85**				7	4.06	.73	98
Citizenship	.84 (.95)*	**.91**			14	3.73	.76	97
Counterproductive	-.64 (-.76)*	-.66 (-.76)*	**.83**		10	1.71	.64	99
Peak Performance	.77 (.89)*	.81 (.91)*	-.49 (-.57)*	**.88**	6	3.66	.83	98

*$p < .01$ (two-tailed, $N = 103$); disattenuated correlations in parentheses

Discussion

This current study began with a theoretical overview of the long and diverse history of performance in workplace settings and across related settings. In workplace settings, broadened conceptions of job performance and improved measurement tools have helped to increase our understanding of work performance, but continued criterion deficiency has persisted when comparing actual performance to our measurement tools (Bartram, 2005; Murphy, 2008). The current research addressed the deficiency by exploring the literature in related fields for evidence of complementary or alternate relevant conceptions of performance. In doing so, it was clear that peak performance is a dominant performance construct in the broader field of performance psychology (Hays, 2009; Privette, 1983; Privette & Landsman, 1983; Ravizza, 1977). While being established in sports quite extensively, peak performance gained popularity among social, personality, and humanistic psychology researchers who generated empirical evidence of its uniqueness, in relation to various life-event constructs, such as peak experiences, failure, and misery (Privette & Bundrick, 1987, 1991).

Although peak performance has been associated with sports the most, it has diversified in recent years to include performing artists, high-risk/high-reliability industries, and executive coaching (Bianco, 2010; Hays, 2009; Robbins, 2020). However, no known measures exist for industry use in typical workplace settings. Researchers and practitioners need a tool for managing the implications of considering peak performance. For instance, it is not yet clear how to target peak performers when developing a recruitment strategy. We might believe we already are trying to target the best candidates, but something still must be missing when our selections yield unexpected outcomes. A tool that can pinpoint more nuanced aspects of performance that isolates

standard/expected performance from optimal/exceptional performance might be what is needed to align our strategies and outcomes with better precision and control. The need for such a tool prompted the peak performance questionnaire to be developed and validated for industry use. Preliminary evidence of its construct validity and relation to known job performance concepts was generated, which offers justification for continuing with this quest.

Review of the Hypotheses and Findings

An 11-item non-job-specific peak performance measure was developed for use in typical workplace settings based on the literature to date. Partial support was produced for Hypothesis 1, which stated that peak performance consists of peak attributes and peak behaviors. Component 1 contained all the intended peak behavior items with no cross-loading, accounted for a large proportion of variance, and achieved high internal consistency. Comparatively, Component 2 represented the peak attributes items but was unstable. One item (i.e., 'acts like he/she expects to be successful at work') was ambiguous and performed poorly and another one (i.e., thinks about performance with a positive attitude') cross-loaded onto the peak behaviors component, leaving only two items to represent peak attributes.

For the ambiguous item, respondents were to rate a target's prediction of the future, which is an introspective activity that cannot be passed on to someone else. Additionally, the intention was to measure self-efficacy/self-confidence, but the item could be misperceived as representing a boastful or arrogant demeanor. Finally, the item was supposed to represent an attribute, but respondents might only know how to rate the target on that item based on observed behavior. For the cross-loading item, although thinking is a behavior, the content of someone else's thoughts is not readily observable,

making it unsuitable to reconsider the item as a behavior item, which typically represents directly observable actions. Additionally, the item was intended to represent a positive attitude about work, an attribute, not the behavior of thinking while at work. After removing the two concerning peak attribute items, the total variance explained improved but the internal consistency reliability of the remaining two-item peak attributes scale was unacceptable. At this early stage of development, the need to focus on measuring more directly observable behaviors became apparent.

Based on the preliminary results, testing the peak behavior items alone was deemed to be the best course of action. The principal components analysis of the seven peak behaviors items alone produced a single strong factor with one concerning item that generated a very low communality and relatively low factor loading compared to the others. The item was designed to measure mindfulness and asks respondents to assess whether the target has demonstrated complete levels of concentration. Although someone might appear to be concentrating, the content of their thoughts could be unrelated to the task at hand. The quality of apparently high levels of concentration only can be measured based on observable outcomes. Removing the item improved the total variance explained and the internal consistency reliability remained high.

The resulting scale of six peak behavior items served to represent a unidimensional measure of peak performance. It was used to test Hypothesis 2, which stated that peak performance, task performance, and organizational citizenship behavior positively inter-relate and negatively relate to counterproductive work behavior. All hypotheses were supported by moderate to strong correlations. The essence of peak performance is recognizable by respondents as being an aspect of effective performance. These findings demonstrate the relevance and relatedness of peak performance in typical

workplace contexts and provide legitimacy for moving onto the confirmatory analyses conducted in Study 2.

Limitations and Implications for Research and Practice

Sample size, sample composition, and research design contribute to the limitations of the findings. Data were collected from a fairly small sample of undergraduate students who likely have limited work experience. Analyses were restricted to examining performance-based correlates of peak performance. The idea was that peak performance should be processed as a performance variable even by less experienced employees. As expected, respondents were able to recognize peak performance behaviors as being related to other aspects of performance that oppose counterproductive behaviors. Study 2 addresses sample and design limits by obtaining a larger dataset from the general population of working adults. Additionally, an outcome measure was included so that various comparative analyses could be conducted to establish the unique predictive ability of peak performance relative to traditional performance constructs. Finally, analyses were conducted on two independent samples for replication purposes.

Due to peak performance being a fairly novel concept in the organizational literature, the measure developed for the study is based on borrowed research that is not well-understood empirically in workplace settings. Although peak performance being present in related fields and novel in the organizational literature forms the basis and rationale for completing the study, it also makes for a grassroots starting point. Perhaps attributes were not well-represented in the scale or are difficult to measure in others due to not being observable directly. Positioning peak performance as a moderator may get at the essence of whether desirable outcomes are, in part, due to an individual possessing peak qualities or attributes. The individual zones of optimal functioning model for sports

suggests the presence of peak attributes, because it is based on anxiety levels prior to competition being the determinant of optimal performance outcomes (Ruiz et al., 2017). In other words, being in the 'in-zone' is more likely to result in a peak performance than being outside the 'in-zone'. This assertion is supported by meta-analytic findings that were based on two decades of research studies of the model (Jokela & Hanin, 1999).

In organizational settings, the growth needs score asserts that individuals vary in growth needs, a similar underlying attribute as those that might be exhibited in peak performers (Hackman & Oldham, 1976). Similarly, Maslow's (1943) need to self-actualize resembles peak performance in life and differs from one person to the next. Maslow later included the need to know and understand (Maslow, 1970a, b), which also vary across individuals. Later on, the core self-evaluations model was established to assess the varying outcomes of individuals based on evaluations of self-based constructs, including self-esteem and self-efficacy (Judge et al., 1997). These core aspects of the self form the basis of our self-image and capacity to perform to varying degrees (Judge et al., 1997). Overall, these various theories and concepts resemble the concepts being targeted in professional practice in recent years for building self-efficacy for enhanced performance. Examples include during skills training (Andersen, 2009); when managing performance under pressure, such as fear of criticism, high expectations, judgments from others, etc. (Hallett, 2011; Hallett & Hoffman, 2014); and for addressing confidence (Gould, 2009). These strategies target internal attributes or states.

Overall, underlying concepts similar to those characterized as peak attributes have been shown to play a role in the outcomes produced across individuals (Bianco, 2010). Because they tend to be internal states or qualities, the best way to assess them might be to consider exploring the role of peak performance as a moderator. Positioning peak

performance as a moderator could lead to insights into the differences between individuals who score exceptional on performance outcomes compared to those who produce more typical results. Future research, therefore, should include multiple measures of performance and a measure of performance outcomes to test the moderating role of peak performance. These recommendations were considered in Study 2.

Future Directions and Concluding Remarks

The current study offers workplaces with insights into the nature of peak, or exceptional, performance. The study supports the assertion that peak performance plays a role in reducing the criterion gap in performance measurement. Future research and practice should include peak performance to better understand its role in relation to known performance measures. A better means of assessing peak attributes should be explored. This could be achieved by testing the role of peak performance as a moderator of expected performance and including a measure of outcomes. To gain an even further understanding, focus should be placed on expanding the peak performance domain to include measureable dimensions for differentially predicting important workplace factors. More robust research methods also are needed for supporting diverse inquiries, such as how to recruit, select, train, and generally acknowledge peak performers in typical workplace settings. These are worthwhile avenues due to the well-established research supporting the role of peak performance in sport psychology, its relation to life events explored in social and personality psychology, and its recent emergence in typical workplace settings.

Study 2 – A Confirmatory Analysis of Peak Performance

Performance has been a construct of interest for over a century, both within and across industries and contexts (Adler et al., 2016; Catano et al., 2015; Hays, 2009; Highhouse, 2008; Kornspan, 2007; Murphy, 2008; Privette, 1983; Privette & Landsman, 1983; Pulakos et al., 2015; Ravizza, 1977; Taylor, 1911). Persistent criterion deficiencies in our current performance metrics in organizational psychology prompted an inquiry into the literature in related fields of psychology for viable conceptions of performance. The review resulted in the rationale presented in Study 1 for considering the role of peak performance in measures of workplace performance (Bianco, 2010; Hays, 2009; Privette, 1983; Privette & Landsman, 1983; Ravizza, 1977). Peak performance itself has a longstanding history in various fields of psychology, including performance, sport, social, personality, and humanistic psychology (Bianco, 2010; Hays, 2009; Kornspan, 2007; Privette, 1981, 1983, 1984; Privette & Bundrick, 1987, 1991).

Over the decades, peak performance became a well-established construct in sports and life-event contexts. In sports, for example, the individual zones of optimal functioning model has remained popular for assessing pre-competition anxiety and its relation to optimal performance in athletes (Ruiz et al., 2017). In social or life-event contexts, over the decades, Privette and colleagues compiled an extensive body of work deciphering peak performance from life events and life experience constructs, such as peak experiences, flow, average events, misery, and failure (Privette, 1981, 1983, 1984, 2001; Privette & Bundrick, 1987, 1991; Privette & Landsman, 1983; Privette & Sherry, 1986). Peak performance since has emerged in typical workplaces in recent years, mainly in executive coaching (Bianco, 2010; Hays, 2009; Robbins, 2020). As described in Study 1, peak performance resembles many well-supported theories used in organizational

settings, including the growth needs and job characteristics aspects of Hackman and Oldham's (1976) job characteristics theory; Maslow's (1943) concepts of self-actualization and cognitive needs (Maslow, 1970a, b); Judge et al.'s (1997) core self-evaluations model containing variables regarding self-image; and even transformational leadership, in terms of excellence in leadership style and the ability to inspire (Bass, 1985; Burns, 1978). The inclusion of peak performance in workplace settings is suitable conceptually and could be useful for reducing the criterion problem (Bartram, 2005).

The current study aims to confirm the peak performance scale devised in Study 1; to assess the unique ability of peak performance for predicting workplace outcomes beyond what is accounted for by task performance (Borman & Motowidlo, 1997; Williams & Anderson, 1991), organizational citizenship behavior (Borman & Motowidlo, 1997; Dalal, 2005; Dunlop & Lee, 2004; Williams & Anderson, 1991), and counterproductive work behavior (Dalal, 2005; Dunlop & Lee, 2004); and to evaluate peak performance as a moderator of job performance outcomes. In place of the peak attributes scale omitted during Study 1, the moderator analysis serves as a proxy test of peak attributes, or the likelihood of achieving performance outcomes based on possessing peak qualities. The substantial history of peak performance and recent interest in considering it in organizational settings justifies the empirical development of a measurement tool for use in research and practice. To accomplish this, Study 1 focused on construction and initial validation of a peak performance questionnaire for industry use. The exploratory study produced preliminary evidence of the construct validity of peak performance and its relation to task performance, organizational citizenship behavior, and counterproductive work behavior.

Performance Dimensions and Performance Outcomes in Perspective

The goal of the current study was to examine the unique ability of peak performance to predict workplace outcomes beyond what is accounted for by task performance, organizational citizenship behavior, and counterproductive work behavior. As described in Study 1, peak performers have high levels of self-confidence and expectations of success, an energized and yet relaxed demeanor, complete levels of concentration and control, keen focus on the task at hand, a positive attitude about performance, and a determined and committed mindset (Krane & Williams, 2006).

Peak performance is an exceptional or optimal performance style that leads to commitment to achieving performance excellence, provided there is a special fit between the individual and the task that comes from a deep place of desire to engage in the task (Garfield, 1986; Hackman & Oldham, 1976; Maslow, 1943, 1970a, b). Essentially, peak performance is considered both latent (i.e., implicit attraction to a given task) and trainable (i.e., mastery of a task through instruction and inspiration to build value for a task) and comprises attributes (i.e., desire and motivation) and behaviors (i.e., opportunity to demonstrate performance; Garfield, 1986; Hackman & Oldham, 1976; Maslow, 1943, 1970a, b). A peak performer executes tasks strategically through expertise developed from desire and devotion. Although training and expertise are needed to execute a peak performance, connection and fit with the task go beyond training and expertise to include passion for the work, a deep emotional bond, and dedication, which manifest as superior use of human potential (Privette, 1981).

Comparatively, task performance is concerned with acceptable execution of job-related activities that are required for organizational effectiveness (Borman & Motowidlo, 1997; Williams & Anderson, 1991). Comparatively, organizational citizenship behaviors

are non-job-related discretionary activities that are considered important because they also influence organizational effectiveness, such as being courteous and helpful toward colleagues (Borman & Motowidlo, 1997; Dalal, 2005; Dunlop & Lee, 2004; Williams & Anderson, 1991). A meta-analysis of 361 studies containing several attitudinal variables has determined that task performance and organizational citizenship behaviors are distinct (Hoffman et al., 2007). Conversely, counterproductive behaviors are intentional behaviors that oppose organizational effectiveness, to varying degrees, from marginally noticeable (e.g., occasional tardiness) to severe (e.g., property destruction; Dalal, 2005; Dunlop & Lee, 2004). Counterproductive behaviors and citizenship behaviors also have been shown to have distinct antecedents (Dalal, 2005).

In essence, task performance represents standard/expected work behavior; organizational citizenship behaviors refer to prosocial behaviors; counterproductive work behaviors are deviant behaviors; and peak performance is exceptional/optimal work behavior. They fundamentally are distinct, because it is possible to possess any given combination. For example, an individual could be completing most of their work tasks at expected levels, some of their work tasks at exceptional levels, while being kind to colleagues and stealing workplace materials. We need to access a desirable combination and a plausible approach for doing so. Study 1 offers a starting place for achieving this goal. For instance, as expected in Study 1, respondents recognized that peak performance relates to task performance and citizenship behaviors and opposes counterproductive behaviors. However, the findings were limited to correlations based on a fairly small student sample. The current study is based on two larger independent samples of working adults from the general population and includes behavior and outcome measures, thereby supporting a broader range of analyses to be completed to support the study goals.

From Study 1, the distinction between peak attributes and peak behaviors also was not represented clearly by the items. Peak attributes might be difficult to measure due to not being observable directly. A way to re-examine the relevance of peak attributes, or the implicit propensity to peak perform, is to position peak performance as a moderator (Ruiz et al., 2017). The individual zones of optimal functioning model for athletes is based on the role of pre-competition anxiety for achieving optimal performance outcomes, which implies the presence of peak attributes contributing, at least in part, to outcome quality (Ruiz et al., 2017). Specifically, before a competition (i.e., at the attributes level), being in the 'in-zone' is more likely to result in a peak performance compared to being out of the 'in-zone'. Meta-analytic findings support the model's assertions (Jokela & Hanin, 1999).

In organizational settings, the growth needs score asserts that individuals differ in growth needs that influence performance, based on fit, thereby positioning the work-related attribute of growth need as a moderator of successful performance in complex jobs (Hackman & Oldham, 1976). Similarly, the core self-evaluations model assesses components of self-image as performance moderators (Judge et al., 1997). Research on core self-evaluations and on growth needs, for instance, is quite similar to that found in peak performance literature, including skills training (Andersen, 2009); performance management while under pressure (Hallett, 2011; Hallett & Hoffman, 2014); and addressing confidence (Gould, 2009). The resemblance of the theories across fields and the positioning of similar constructs as moderators support peak performance being tested as a moderator in the current study.

In order to test the uniqueness of peak performance for predicting job performance outcomes, the meaning of outcomes needs to be clarified and an outcome measure needed to be available. For the current study, task performance refers to the in-role behaviors that

are intended to lead to an outcome, whereas job performance outcomes refer to the completed task or end result of in-role behaviors. A second clarification is that a completed task or end result could be excellent, but the effectiveness of an excellent end result still could be poor. For example, a clock could be built to perfection but never get sold. It is the clock-building process (behaviors) and the quality of the clock itself (outcome) that is of interest in the study. The seven-item in-role behavior scale of the Williams and Anderson (1991) measure contains four items that represent behaviors and three items that represent results (i.e., job performance outcomes). For this research, the behavior items served to represent task performance and the results items served to represent job performance outcomes (see Appendix A). Actual performance and outcome data were not available for the individual being measured in this research. Dividing the in-role behavior scale into behaviors and outcomes made it possible to test the uniqueness of peak performance for predicting job performance outcomes, beyond what is predicted by task performance, citizenship behavior, and counterproductive work behavior.

Study 2

The goal of Study 2 was to confirm the non-job-specific peak performance measure refined in Study 1 and to evaluate the construct and predictive validity of peak performance, when compared to task performance, organizational citizenship behavior, and counterproductive work behavior. This research defines peak performance as a unidimensional set of behaviors and underlying attributes that characterize exceptional or optimal performance and superior potential and function, including high self-confidence and expectations of success, an energized and yet relaxed demeanor, complete levels of concentration and control, keen focus on the task at hand, a positive attitude about

performance, and a determined and committed mindset (Krane & Williams, 2006). Four hypotheses were examined.

Hypotheses

Hypothesis 1. The six peak performance items represent a unidimensional scale.

Hypothesis 2. Task performance, organizational citizenship behavior, counterproductive work behavior, and peak performance individually predict job performance outcomes.

Hypothesis 3. Peak performance uniquely predicts job performance outcomes beyond task performance, organizational citizenship behavior, and counterproductive work behavior.

Hypothesis 4. Peak performance moderates the links between each of the triadic factors of job performance (i.e., task performance, organizational citizenship behavior, and counterproductive work behavior) and job performance outcomes.

Method

Participants

Participants were 360 working adults from the general Canadian population who ranged from 23 to 73 years of age (M = 34.2, SD = 9.7). They varied in age, gender, and ethnicity and were expected to have worked for the same supervisor for at least six months. They were divided randomly into two samples of N = 174 and N = 186 participants to assess the stability of the results across independent samples. Table 2.1 contains participant and supervisor demographics.

Procedure

Participants were invited directly by Qualtrics to participate in the study hosted by them. Qualtrics is a company that offers online surveying services and compensates participants

Table 2.1

Demographicsof Participants, Their Jobs, and Their Supervisors

Categorical Data		Sample 1		Sample 2	
		N	**%**	***N***	**%**
Participant Gender	Male	84	48.3	96	51.6
	Female	90	51.7	90	48.4
	Total	174	100.0	186	100.0
Participant Education	Grade school	1	0.6	0	0.0
	High school graduate	22	12.6	17	9.1
	Some college/trade/tech	44	25.3	41	22.0
	College/trade/tech graduate	43	24.7	66	35.5
	Some university	3	1.7	2	1.1
	Undergraduate degree	26	14.9	27	14.5
	Some graduate work	8	4.6	10	5.4
	Graduate degree	27	15.5	23	12.4
	Total	174	100.0	186	100.0
Supervisor Gender	Male	109	62.6	109	58.6
	Female	65	37.4	77	41.4
	Total	174	100.0	186	100.0

Continuous Data		Participant Age in Years	Participant Work Hours Per Week	Years Knowing the Supervisor	Years Worked for the Supervisor
Sample 1	***Mean***	35.2	40.9	3.5	2.4
	SD	10.2	7.5	5.1	2.6
Sample 2	***Mean***	33.2	41.3	3.3	2.1
	SD	9.1	7.6	5.9	2.3

financially using their standard compensation procedures. The study invitation informed participants that the research involved investigating how best to define and measure job performance. Participants were informed that the study would take about 15 to 20 minutes and that they would receive standard compensation from Qualtrics for completing the study. Participants were told that participation is voluntary and anonymous and that they could discontinue, at any time and without penalty, by closing their internet browser. They were informed that the study received Saint Mary's University Research Ethics

Board approval and were provided contact information, if they had any questions. Individuals who chose to participate clicked on a hyperlink that directed them to the Qualtrics-hosted online survey package, which contained an informed consent form; demographic questions about themselves, their job, and supervisor they were to rate; the job performance rating scales; and a final feedback statement about the study and how to obtain results (see Appendix B).

Measures

Participants completed demographic items about themselves, their job, and the person they were rating, followed by the job performance survey items representing task performance, organizational citizenship behavior, counterproductive work behavior, and peak performance. Participants brought to mind someone who has, or had, supervised them for at least six months and then rated each survey item based on how well it described the supervisor. All items were rated on a five-point Likert scale that ranged from 1 (‘strongly disagree’) to 5 (‘strongly agree’).

Task performance, citizenship behavior, and outcomes. Task performance, organizational citizenship behavior, and job performance outcomes were measured using a survey devised by Williams and Anderson (1991). The 21-item scale measures in-role behavior, citizenship behaviors toward individuals, and citizenship behaviors toward the organization. For the current study, four behavior-based in-role items were used to measure task performance; three results-based in-role items were used to measure job performance outcomes; and the 14 citizenship items were aggregated to represent overall organizational citizenship behavior. Cronbach’s (1951) alpha for internal consistency reliability overall was reported as $\alpha = .83$, and was $\alpha = .91$ for in-role behavior, $\alpha = .88$ for citizenship behaviors toward individuals, and $\alpha = .75$ for citizenship behaviors toward

the organization (Williams & Anderson, 1991). For Study 1, alpha was α = .85 for task performance (based on all seven in-role items) and α = .91 for overall organizational citizenship. For the current, for the sample of N = 174 respondents, alpha was α = .84 for the overall in-role scale, α = .63 for task performance, α = .89 for organizational citizenship, and α = .86 for performance outcomes. For the second sample of N = 186 respondents, alpha was α = .86 for the in-role scale, α = .70 for task performance, α = .87 for organizational citizenship, and α = .83 for performance outcomes.

Counterproductive work behavior. The Counterproductive Work Behavior Check was used to measure counterproductive work behavior (Spector et al., 2006). The scale assesses intentional behaviors that are harmful to individuals and organizations and has five dimensions that are contained in two factors of counterproductive work behavior directed at the individual level and the organizational level: sabotage (items 1-3), withdrawal (items 4-7), production deviance (items 8-10), theft (items 11-14), and abuse (items 16-33). Cronbach's (1951) alpha for counterproductive work behavior overall was reported as α = .87, and as α = .85 for counterproductive work behavior toward individuals and α = .84 for counterproductive work behavior toward the organization (Spector et al., 2006). For the individual subscales, alpha was α = .42 for sabotage, α = .63 for withdrawal, α = .61 for production deviance, α = .58 for theft, and α = .81 for abuse (Spector et al., 2006).

To reduce the number of items that the participants needed to complete, the abuse scale was excluded. Also, during Study 1, the theft component produced very little variability in responses, likely due to it being difficult to observe theft directly. Therefore, the theft scale also was removed for the current study. The retained items were aggregated to represent overall counterproductive work behavior. For Study 1,

Cronbach's (1951) alpha was α = .83. For the current study, alpha was α = .90 for the sample of N = 174 respondents and α = .84 for the sample of N = 186 respondents. Reducing the number of items for respondents to complete and aggregating the scores improved the overall reliability for use in the current study.

Peak performance. No known non-job-specific measure of peak performance exists for use in research and practice. The absence of a known measure prompted the creation of the peak performance questionnaire from Study 1 to be confirmed in the current study. Using published guidelines (Crocker & Algina, 1986; Wright et al. (2017), eleven peak performance items were created (four attribute items and seven behavior items). Exploratory analyses detected the stability of the behavior items but not the attributes items. When the peak behavior items were tested alone, one strong factor emerged with the removal of a single item. Cronbach's (1951) alpha for the six retained items to be confirmed in the current study was α = .88. For the current study, Cronbach's (1951) alpha for the six items was α = .88 for the sample of N = 174 respondents and α = .90 for the sample of N = 186 respondents. During the confirmation analysis, an additional item was removed (i.e., 'acts highly committed at work'), leaving five peak performance items for use in the remaining analyses. For the five items, Cronbach's (1951) alpha was α = .85 for the sample of N = 174 respondents and α = .87 for the sample of N = 186 respondents.

Data Analysis Procedure

Data were screened, cleaned for univariate outliers, and randomly split into two independent samples of N = 174 and N = 186 participants. After computing inter-item correlations, confirmatory factor analyses were used to confirm the single-factor six-item peak performance scale identified in Study 1 (Hypothesis 1). Although confirmatory

factor analysis is intended to confirm previously refined items, the items in the current study initially were developed from a borrowed theoretical framework, without guidance from known measures or empirical properties in typical workplace settings, due to the novelty of peak performance in the organizational literature. Furthermore, exploratory analyses in Study 1 were conducted on data from a fairly small sample of students with limited work experience. At this stage, it was more important to have a fewer number of good items on which to build in later research than to have a greater number of fairly adequate items. Therefore, the current study considered the following inclusion criteria when interpreting the initial confirmatory factor analysis of the six items from Study 1: conceptual representation, excessively high inter-correlations that indicate redundancy, changes in Cronbach's (1951) alpha, factors loadings, suggested modifications due to correlated errors (Brown, 2015), and improved fit indices and/or a significant chi-square change. Following the confirmatory factor analysis, means, standard deviations, correlations, and Cronbach's (1951) alpha were calculated for each sample for the scales used in the remaining analyses.

Hierarchical multiple regression was used to test the ability of task performance, organizational citizenship behavior, counterproductive work behavior, and peak performance to individually predict performance outcomes (Hypothesis 2) and to assess the unique ability of peak performance to predict performance outcomes beyond what is predicted by task performance, organizational citizenship behavior, and counterproductive work behavior (Hypothesis 3; Pedhazur & Schmelkin, 1991). To supplement the findings, a redundancy analysis was completed to better understand the magnitude of the performance facets. The analysis was completed by reversing the hierarchical multiple regression steps by entering peak performance during Step 1,

followed by task performance, organizational citizenship behavior, and counterproductive work behavior during Step 2. Furthermore, Study 1 identified strong relationships among the performance dimensions. To account for potentially strong relationships while assessing uniqueness, the current study included a relative weights analysis for additional support (Tonidandel & LeBreton, 2015). Doing so enables the unique contribution of each predictor to be examined more closely for its distinctiveness and magnitude of contribution.

Finally, peak performance is theorized as exceptional performance, which might influence the extent to which expected/standard job behaviors result in intended outcomes (Hackman & Oldham, 1076; Ruiz et al., 2017). Therefore, multiple regression was used to assess peak performance as a moderator of the links between each of the triadic factors and overall job performance (Hypothesis 4; Pedhazur & Schmelkin, 1991). Confirmatory factor analyses were conducted using LISREL (Jöreskog & Sörbom, 1993). All other analyses were conducted using SPSS (IBM Corp., 2020).

Results

Hypothesis 1: Confirmatory Analyses

A confirmatory factor analysis with maximum likelihood estimation was used to test the six-item unidimensional model of peak performance. Preliminary evidence supports a single-factor model for both samples. Both samples produced satisfactory Cronbach's (1951) alpha levels and factor loadings for all six items. Alpha if item deleted ranged from α = .84 to α = .88 across both samples and factor loadings ranged from .58 to .82 for the first sample and .60 to .85 for the second sample. However, Item 6 is concerning conceptually ('acts highly committed at work'), because it measures commitment at work, which could be introducing criterion contamination. Although

affective commitment is an aspect of peak performance in sport psychology literature (Hays, 2009), which was the basis for generating the item, meta-analytic findings have determined commitment in standard workplace settings to be a multifaceted construct that represents affective, normative, and continuance commitment, each with unique antecedents, correlates, and consequences (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). Even though evidence exists for the positive link between affective commitment and work outcomes, the link is weaker for normative commitment, and nonexistent, or even negative, for continuance commitment (Meyer et al., 2002). Because commitment is multifaceted, a single item cannot measure it effectively, and it is unclear that Item 6 targets the affective component specifically.

The recommended modifications resulting from the confirmatory factor analysis noted a correlated error stemming from Item 6 for the first sample and two correlated errors stemming from Item 6 for second sample. Error can be systematic or random. If it is shared with another variable, it could indicate the systematic impact of an unintended factor on the variables in the study (Brown, 2015). This finding could be the unintended facets of commitment influencing participant ratings. As such, the item is deficient and possibly contaminating the results. Comparatively, Item 5 measures determination, which is similar to commitment – one must be committed to be determined. As shown in Table 2.2, Items 5 and 6 are strongly related (r = .67 for Sample 1; r = .72 for Sample 2). The weighted mean correlation for the two samples is highest between Items 5 and 6 compared to all other inter-item correlations. However, determination is based on persistent engagement, whereas commitment is attitudinal and more difficult to observe and decipher. Study 1 supports using behaviors rather than attributes to measure peak

performance. The potential deficiency and contamination of Item 6 and presence of the highly-related and more behaviorally-based Item 5 justify the removal of Item 6.

Table 2.2

Peak Performance Inter-item Correlations for Sample 1 / Sample 2

Peak Performance Items	**1**	**2**	**3**	**4**	**5**
1. Has demonstrated superior use of human potential.					
2. Has demonstrated an incidence of superior functioning.	.47* / .67*				
3. Acts energized and yet relaxed.	.58* / .64*	.44* / .54*			
4. Gets keenly focused on the task at hand.	.63* / .58*	.52* / .42*	.60* / .55*		
5. Acts highly determined at work.	.54* / .70*	.36* / .57*	.57* / .55*	.58* / .54*	
6. Acts highly committed at work.	.57* / .63*	.45* / .55*	.59* / .57*	.68* / .60*	.67* / .72*

*p<.01 (two-tailed)

Table 2.3 shows the factor loadings and modification indices for both samples, before and after removing Item 6. For the first sample, the six-item model was a good fit, but the five-item model achieved a non-significant chi-square and was a perfect fit, with no recommended modifications ($\chi^2(5) = 4.47$, $N = 174$, $p > .05$; *CFI* = 1.00; *NFI* = .99; *RMSEA* = .000, ns). For the second sample, the six-item model was less clear compared to the first sample, but the five-item model achieved a non-significant chi-square and was a good fit, with no recommended modifications ($\chi^2(5) = 7.99$, $N = 186$, $p > .05$; *CFI* = .99; *NFI* = .99; *RMSEA* = .057, ns; Pedhazur & Schmelkin, 1991; Tabachnick & Fidell, 2001). The final five-item unidimensional scale supports Hypothesis 1 and appears to be the most succinct set of items to represent peak performance, while minimizing redundancy and contamination.

Table 2.3

Factor Loadings for the Peak Performance Models

Items and Factors Loadings	Round 1 Sample 1	Round 1 Sample 2	Round 2 Sample 1	Round 2 Sample 2
1. Has demonstrated superior use of human potential.	.74	.85	.77	.89
2. Has demonstrated an incidence of superior functioning.	.58	.72	.60	.73
3. Acts energized and yet relaxed.	.74	.73	.75	.73
4. Gets keenly focused on the task at hand.	.82	.69	.82	.66
5. Acts highly determined at work.	.75	.82	.71	.78
6. Acts highly committed at work.	.82	.80	-	-

Fit Indices		χ^2	*df*	*p*	*RMSEA*	*RMSEA* 90% *CI*	*NFI*	*PNFI*	*CFI*	*IFI*	*SRMR*	*GFI*	*PGFI*
Round 1	**S1**	15.34	9	.082	.064	.00-.12	.98	.59	.99	.99	.029	.97	.42
	S2	29.74	9	.000	.112	.069-.16	.97	.58	.98	.98	.035	.95	.41
Round 2	**S1**	4.47	5	.484	.000	.00-.10	.99	.50	1.00	1.00	.021	.99	.33
	S2	7.99	5	.157	.057	.00-.13	.99	.49	.99	.99	.026	.98	.33

Table 2.4 shows descriptive statistics, bivariate correlations, and Cronbach's (1951) alpha (bolded along the diagonal) for both samples for the final scales used in the remaining analyses.

Table 2.4

Scale Descriptive and Inferential Statistics for Samples 1 and 2

	Task Performance (4 items)		Citizenship Behavior (14 items)		Counter-productive (10 items)		Peak Performance (5 items)		Overall Job Performance (3 items)	
Sample	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
Task Performance	**.63**	**.70**								
Citizenship Behavior	.72*	.71*	**.89**	**.87**						
Counterproductive Behavior	-.61*	-.53*	-.62*	-.58*	**.90**	**.84**				
Peak Performance	.70*	.73*	.81*	.82*	-.45*	-.42*	**.85**	**.87**		
Overall Job Performance	.76*	.80*	.76*	.76*	-.53*	-.46*	.79*	.78*	**.86**	**.83**
***Mean* (1-5)**	4.13	4.05	3.86	3.83	1.56	1.59	3.90	3.81	4.23	4.17
SD	0.75	0.80	0.75	0.71	0.74	0.64	0.84	0.89	0.84	0.83

*p<.01 (two-tailed); N = 186 for Sample 1; N = 174 for Sample 2

Hypotheses 2 and 3: Predictive Analyses

The ability of task performance, citizenship behavior, counterproductive work behavior, and peak performance to each predict performance outcomes (Hypothesis 2) was assessed using hierarchical multiple regression (Pedhazur & Schmelkin, 1991). As shown in Table 2.5, all job performance predictors significantly predicted performance outcomes, except for counterproductive work behavior. For Sample 1, peak performance was the strongest predictor ($\beta = .396$, $p < .01$), followed by task performance ($\beta = .343$, $p < .01$), then by organizational citizenship behavior ($\beta = .169$, $p < .05$). For Sample 2, task performance was the strongest predictor ($\beta = .454$, $p < .01$), followed by peak performance ($\beta = .261$, $p < .01$), then organizational citizenship behavior ($\beta = .239$, $p < .01$). Excluding counterproductive work behavior, results support Hypothesis 2.

Also shown in Table 2.5 are the results of the hierarchical multiple regression assessing the ability of peak performance to predict performance outcomes beyond what is predicted by task performance, organizational citizenship behavior, and counterproductive work behavior (Hypothesis 3; Pedhazur & Schmelkin, 1991). For Sample 1, task performance, organizational citizenship behavior, and counterproductive work behavior combined (Step 1) was a significant predictor of performance outcomes ($R^2 = .678$, $p < .01$). Even though the difference was small ($R^2 = .046$, $p < .01$), the addition of peak performance as a unique predictor (Step 2) was significant, $\Delta F(1, 169) = 28.31$, $p < .01$. For Sample 2, task performance, organizational citizenship behavior, and counterproductive behavior combined (Step 1) also was a significant predictor of performance outcomes ($R^2 = .713$, $p < .01$). Although the difference was smaller than for Sample 1 ($R^2 = .018$, $p < .01$), the addition of peak performance as a unique predictor

(Step 2) also was significant, $\Delta F(1, 181) = 12.36$, $p < .01$. Even though changes were small for both samples, the results support Hypothesis 3.

Table 2.5

Hierarchical Multiple Regression Analysis of the Predictors

Sample 1 (*N* = 174)		***B***	**SE**	***β***	***ΔR²***	***ΔF***
Step 1	Task Performance	.510	.073	.461*		
	Citizenship Behavior	.495	.073	.446*	.678*	
	Counterproductive	.029	.066	.026		
Step 2	Task Performance	.380	.072	.343*		
	Citizenship Behavior	.188	.089	.169**	.046*	$\Delta F(1, 169) = 28.31$*
	Counterproductive	-.042	.063	-.037	Total $\Delta R^2 = .724$*	
	Peak Performance	.394	.074	.396*		
Sample 2 (*N* = 186)		***B***	**SE**	***β***	***ΔR²***	***ΔF***
Step 1	Task Performance	.558	.059	.541*		
	Citizenship Behavior	.481	.070	.411*	.713*	
	Counterproductive	.085	.064	.066		
Step 2	Task Performance	.468	.063	.454*		
	Citizenship Behavior	.280	.089	.239*	.018*	$\Delta F(1, 181) = 12.36$*
	Counterproductive	.040	.063	.031	Total $\Delta R^2 = .731$*	
	Peak Performance	.243	.069	.261*		

*$p < .01$; **$p < .05$

Results of the redundancy analysis appear in Table 2.6. For Sample 1, peak performance alone (Step 1) was a strong predictor ($R^2 = .627$, $p < .01$). The addition of task performance, organizational citizenship, and counterproductive work behavior (Step 2) was a fair improvement ($R^2 = .098$, $p < .01$) and was significant, $\Delta F(1, 169) = 20.01$, $p < .01$. For Sample 2, peak performance alone (Step 1) again was a strong predictor ($R^2 = .602$, $p < .01$). The addition of task performance, organizational citizenship, and counterproductive work behavior (Step 2) again was a fair improvement ($R^2 = .129$, $p < .01$) and was significant, $\Delta F(3, 181) = 28.97$, $p < .01$. Although the addition of task

performance, organizational citizenship, and counterproductive work behavior was a significant improvement for both samples, peak performance alone was a strong predictor for being a considerably small set of five items. The findings offer additional support for Hypothesis 3 and the unique influence of peak performance.

Table 2.6

Redundancy Analysis of Peak Performance as a Predictor

Sample 1 (*N* = 174)		***B***	**SE**	***β***	***ΔR²***	***ΔF***
Step 1	Peak Performance	.788	.046	.792*	.627*	
Step 2	Peak Performance	.394	.074	.396*		
	Task Performance	.380	.072	.343*	.098*	$\Delta F(3, 169) = 20.01$*
	Citizenship Behavior	.188	.089	.169**	Total $\Delta R^2 = .724$*	
	Counterproductive	-.042	.063	-.037		
Sample 2 (*N* = 186)		***B***	**SE**	***β***	***ΔR²***	***ΔF***
Step 1	Peak Performance	.724	.043	.776*	.602*	
Step 2	Peak Performance	.243	.069	.261*		
	Task Performance	.468	.063	.454*	.129*	$\Delta F(3, 181) = 28.97$*
	Citizenship Behavior	.280	.089	.239*	Total $\Delta R^2 = .731$*	
	Counterproductive	.040	.063	.031		

*$p < .01$; **$p < .05$

Hypothesis 4: Moderator Analyses

Multiple regression was used to test if peak performance moderates the links between each of the triadic factors of job performance (i.e., task performance, organizational citizenship behavior, and counterproductive work behavior) and job performance outcomes (Hypothesis 4). For both samples, the overall results were significant, $F(3, 170) = 15.49$, $p < .01$ for Sample 1 and $F(3, 182) = 14.88$, $p < .01$ for Sample 2. However, only task performance was moderated by peak performance (for Sample 1, $\beta = -.385$, $p < .01$; for Sample 2, $\beta = -.410$, $p < .01$), whereas organizational

citizenship behavior and counterproductive work behavior were not, which partially supports Hypothesis 4. Results of the moderator analyses appear in Table 2.7.

Table 2.7

Peak Performance as a Moderator of Job Performance Outcomes

Sample 1 (*N* = 174)	***B***	**SE**	***β***	***R***	***R*²**	***F***
Peak by Task	-.395	.113	-.385*			
Peak by Citizenship	-.131	.125	-.116	.463	.215	$F(3, 170) = 15.49$*
Peak by Counter	-.027	.107	-.024			
Sample 2 (*N* = 186)	***B***	**SE**	***β***	***R***	***R*²**	***F***
Peak by Task	-.338	.088	-.410*			
Peak by Citizenship	-.071	.107	-.068	.444	.197	$F(3, 182) = 14.88$*
Peak by Counter	-.038	.112	-.030			

*$p < .01$

Relative Weights Analyses: Predictors of Performance Outcomes in Perspective

Table 2.8 shows the stability of the two samples throughout the study. There were no differences on any of the measured factors (i.e., relative weights confidence intervals (CI) for all factors contain 0). Overall $R^2 = .73$ and was $R^2 = .74$ for each sample. Peak performance was the strongest predictor for Sample 1 (30.09%), followed by task performance (24.89%). The finding reversed for Sample 2 (31.99% for task performance versus 25.93% for peak performance). Table 2.9 shows CIs for the weights in Table 2.8, which indicate each factor's predictive ability overall and when compared to peak performance. For both samples, all weights were significant, except for peak as a moderator of counterproductive work behavior. When compared to peak performance, for both samples, counterproductive work behavior and the moderators did not perform significantly as well, but task performance and organizational citizenship behavior did perform significantly as well. Therefore, peak performance is as effective in some cases and more effective in other cases for predicting performance outcomes.

Table 2.8

Stability of the Findings Across the Two Samples

	Relative Weights			CI Tests of Sample Differences	
	Overall (%)	**Sample 1 (%)**	**Sample 2 (%)**	**Lower**	**Upper**
Task Performance	28.56	24.89	31.99	-0.121	0.011
Organizational Citizenship Behavior	23.41	22.75	23.68	-0.063	0.045
Counterproductive Work Behavior	8.34	9.11	7.31	-0.038	0.065
Peak Performance	27.93	30.09	25.93	-0.034	0.106
Task by Peak Performance	6.61	7.41	6.21	-0.036	0.059
Citizenship by Peak Performance	3.22	3.72	2.86	-0.026	0.039
Counterproductive by Peak Performance	1.92	2.02	2.03	-0.027	0.025
Total R^2	.73	.74	.74		

Table 2.9

Relative Weights of the Predictors of Job Performance Outcome

	Sample 1 (*N* = 174)				**Sample 2 (*N* = 186)**			
	CI Tests of Factor Weights*		**CI Tests of Factor Weights Compared to Peak Performance***		**CI Tests of Factor Weights***		**CI Tests of Factor Weights Compared to Peak Performance***	
	Lower	**Upper**	**Lower**	**Upper**	**Lower**	**Upper**	**Lower**	**Upper**
Task	0.145	0.230*	-0.122	0.036	0.191	0.291*	-0.022	0.122
OCB	0.135	0.207*	-0.124	0.008	0.138	0.221*	-0.069	0.034
CWB	0.029	0.105*	-0.245	-0.083*	0.019	0.090*	-0.202	-0.080*
Peak	0.170	0.286*	Not applicable		0.155	0.237*	Not applicable	
Task by Peak	0.019	0.097*	-0.235	-0.110*	0.019	0.081*	-0.201	-0.086*
OCB by Peak	0.006	0.057*	-0.266	-0.141*	0.004	0.057*	-0.222	-0.123*
CWB by Peak	-0.002	0.040	-0.281	-0.151*	-0.001	0.041	-0.225	-0.133*

*CI Tests show differences in relative weights and are significant when the CI excludes zero for a given variable.
Task = task performance; OCB = organizational citizenship behavior; CWB = counterproductive work behavior; Peak = peak performance

Discussion

The longstanding criterion gap in performance measurement in workplaces prompted an interest in seeking out alternate viable conceptions of performance in the broader psychological literature. In performance psychology, peak performance is an important and longstanding performance style (Privette, 1981, 1991; Hays, 2009). Its substantial history, resemblance to organizational psychology constructs, and recent emergence in workplace settings justify the empirical development of a peak performance measurement tool for use in research and practice. This task was initiated in Study 1 with the development of four peak attribute items and seven peak behavior items. The attributes scale was unstable and was removed. When the seven behavior items were assessed alone, a single factor emerged and one item was removed. Initial evidence of the construct validity of peak performance was generated, along with a preliminary understanding of its relation to task performance, organizational citizenship behavior, and counterproductive work behaviors. However, the findings were limited to a fairly small sample of students, correlations, and no outcome variables to test predictions. Nonetheless, they were sufficient for confirming the measure and conducting the predictive analyses in the current study.

The current study was based on two larger independent samples of working adults from the general population. It included behavior and outcome measures to assess the unique ability of peak performance to predict performance outcomes beyond task performance, organizational citizenship behavior, and counterproductive work behaviors. It also evaluated peak performance as a moderator of job performance outcomes. The goal was to better understand the attributes that might underlie workplace performance behaviors toward achieving performance outcomes (Hackman & Oldham, 1976; Judge et

al., 1997; Ruiz et al., 2017). Moderator analyses were important because of having to abandon the peak attribute items in Study 1 and only retaining peak behavior items. Overall, the current results offer promise for the viability of establishing peak performance in research and practice.

Review of the Hypotheses and Findings

The confirmatory factor analysis results of the initial six-item unidimensional scale from Study 1 were a good fit for Sample 1 and a fair fit for Sample 2, supporting Hypothesis 1. However, the set contained a commitment item, which was concerning. Although the definition of peak performance includes commitment (Krane & Williams, 2006), the definition is borrowed from sport psychology. Individuals in sports are noticed more readily when they are not performing well because of commitment. Often, sports are team-based and become highly competitive in early years, causing youth who are not particularly affectively committed to self-select out early on or be excluded from top-level teams. In typical workplace settings, however, competitiveness and performance style are not as obvious or consequential. For instance, an office administrator perhaps never thinks about competitiveness. In this case, it is less clear what kind of commitment the administrator experiences compared to an athlete who has been playing a sport notably well since childhood and likely loves the sport deeply.

In traditional workplace settings, commitment includes affective, normative, and continuance commitment. Affective commitment opposes continuance commitment on many workplace outcome measures (Meyer et al., 2002). A single item intended to represent a multidimensional construct with known competing underpinnings is deficient and possibly contaminating the results (Catano et al., 2015). Comparatively, the determination item was strongly related to the commitment item, but its essence is

behavior-based (i.e., determination involves persistent engagement) compared to commitment, which is attitudinal, less observable, and more difficult to decipher. Study 1 results supported the removal of the less observable items (i.e., by removing the attributes scale), which is in line with the rationale for excluding the commitment item in the present behavior-based scale. The presence of the determination item offers some assurance that the intended aspect of commitment (i.e., affective) is represented in the scale. A second round of confirmatory factor analyses that excluded the commitment item yielded a strong fit for both samples. The final five items appear to be the most succinct representation of peak performance that minimizes redundancy and contamination.

For both samples, task performance, organizational citizenship behavior, and peak performance predicted performance outcomes, but counterproductive work behavior did not. It could be that deviant behavior is difficult to see happening. Typically, it is the cumulative result that is noticed, such as financial losses or multiple absences over time or workplace items that go missing that take time to notice and effort to trace (Dalal, 2005). Additionally, behaviors that seem deviant may have explanations that are unknown to the rater. For example, a supervisor could appear to be late regularly when in fact the supervisor does all off-site meetings with clients during morning hours. The rater might not realize this and is told simply to text the supervisor, if needed, leaving the rater to believe the supervisor misses a lot of work hours. Counterproductive behaviors are likely best assessed within an individual organizational to achieve more stable results, where tacit understanding of workplace norms and roles helps distinguish actual deviant behaviors from questionable behaviors. Overall, the results mostly support Hypothesis 2.

For both samples, peak performance predicted performance outcomes beyond what was accounted for by task performance, organizational citizenship behavior, and

counterproductive work behavior, supporting Hypothesis 3. Although the differences were small, the redundancy analyses showed that peak performance performs well alone as a predictor, especially for only five items (Sample 1 R^2= .627; Sample 2 R^2= .602). Even though including task performance, organizational citizenship behavior, and counterproductive work behavior significantly improved the prediction, gains were relatively small for 30 additional items (Sample 1 R^2= .098; Sample 2 R^2= .129). These findings supplement the support for Hypothesis 3.

Alone, peak behaviors appear to offer insight into work attitudes, making it important to measure internal processes. Therefore, treating peak performance as a moderator could substitute for the absence of an actual attributes scale, which was the basis of Hypothesis 4. Multiple regression analyses were used to test if peak performance moderates the links between each of the triadic factors of job performance (i.e., task performance, organizational citizenship behavior, and counterproductive work behavior) and job performance outcomes. For both samples, the overall results were significant, but only task performance was moderated by peak performance, whereas organizational citizenship behavior and counterproductive work behavior were not, which partially supports Hypothesis 4. This finding supports the idea that peak performance is highly job-related behavior. However, knowing someone's score on peak performance will not necessarily help to understand if the individual is friendly, honest, etc.

The relative weights analyses (Tonidandel & LeBreton, 2015) were conducted as a final set of supplemental analyses for three purposes. The first reason was to assess the stability of the two samples for comparative purposes when interpreting the results of the predictive analyses. The two samples used for the study were determined to be stable, having produced no significant differences on any of the measured factors. This offers

additional assurance in the ability to replicate the findings. The second reason was to test the relative contributions of each of the job performance predictors because the scales are considerably related. All weights were significant, except for peak as a moderator of counterproductive work behavior. Peak performance was the strongest predictor for Sample 1, followed by task performance, which reversed for Sample 2. The final reason was to assess the efficacy of each predictor against peak performance. For both samples, task performance and organizational citizenship behavior performed significantly as well as peak performance, but counterproductive work behavior and the three moderator variables did not. Overall, the findings support peak performance as an effective predictor of performance outcomes that should be included in research and practice.

Limitations and Implications for Research and Practice

Based on the recommendations from Study 1, Study 2 addressed sample and design limits by obtaining a larger dataset from the general population of working adults, by administering measures of predictors and outcomes in order to conduct regression and relative weights analyses, and by repeating all analyses on two independent samples to demonstrate the stability of the findings. These inclusions helped to begin the legitimate establishment of peak performance as a unique predictor of performance outcomes. This is especially important because of the novelty of the concept in typical workplaces and the need to borrow the underpinnings from the broader psychology literature. The attempt to measure attributes was unsuccessful in Study 1, although the redundancy analyses helped to demonstrate the strength of peak performance on its own, while the moderator analyses helped to fill the gap of not having a direct measure of attributes. This approach is seen across fields in psychology, where attributes and other internal states are targeted as a means of modifying outcomes, such as with the individual zones of optimal

functioning model for sports (Jokela & Hanin, 1999; Ruiz et al., 2017); the growth needs score (Hackman & Oldham, 1976) and core self-evaluations model (Judge et al., 1997) in workplace settings; and with the fulfillment of needs outlined by Maslow (1943, 1970a, b) in personal, social, and professional development.

The current study obtained data from general population participants with numerous work backgrounds. Although data from working adults improves the external validity of the results, the main challenge is control over the source of the information gathered. Participants might be reporting from a wide range of experiences, workplace cultures, leadership styles, etc., which creates similar limits to those discussed about accurately measuring counterproductive work behavior. Furthermore, not obtaining data from a particular workplace means that the research is not based on specific outcomes. Rather, the in-role behavior scale used in the study was separated into task performance items and performance outcome items. Actual performance and outcome data would add legitimacy to the findings, which would involve accessing a suitable workplace. For example, the measures could be administered before and after a peak performance training program so that ratings would be based on the performance and outcomes of actual work tasks. Although Study 3, the final study in the series, also recruited participants from the general population of working adults, the problem of control was managed by using an experimental design and suitable external criteria, specifically, ratings of acknowledgement worthiness, rewardability, and promotability (DePater, VanVianen, Bechtoldt, & Klehe, 2009; Sveinsdottir, Ragnarsdottir, & Blondal, 2016).

Future Directions and Concluding Remarks

Peak performance is an important and longstanding performance style that has emerged recently in typical workplaces. However, its empirical properties are not known

in typical work contexts, which revealed the need for an empirically-devised measure of peak performance for use in research and practice. Although Study 1 was based on a fairly small student sample and correlational analyses, peak performance showed relevancy in relation to other known performance variables in workplaces. From the current study, the potential influence of peak performance in workplace settings has become even more apparent, based on stable results across two samples and on a variety of analyses. Together, the studies support the assertion that peak performance is a unique performance style that has the potential to predict workplace outcomes, which is explored more broadly in Study 3.

For both Study 1 and Study 2, attempting to measure counterproductive work behavior was problematic. Unless data are able to be obtained from an actual organization that has expressed concerns with deviant behaviors, it might never be that simple to measure and might be better off left out of future general population research of this nature. It could also be that the peak performance measure itself needs more work. The current peak performance measure is a five-item unidimensional scale that appears relevant and succinct but could be deficient. Along the way, attributes items, an item measuring concentration at work (intended to measure mindfulness; Krane & Williams, 2006), and a commitment item (Krane & Williams, 2006) were removed during scale development. That is not to say these are not important aspects of peak performance. Rather, the current measure appears suitable for now to demonstrate the importance of peak performance, which is a necessary first step, followed by establishing that it predicts important workplace factors. Once its usefulness has been established, future research can shift toward expanding the peak performance domain to include measureable dimensions for differentially predicting important workplace factors. From there, practical

applications can be considered, such as how to recruit, select, train, identify, and generally acknowledge peak performers in workplace contexts (Catano et al., 2015). Ideally, this research would occur in an actual workplace setting, in which a comprehensive approach can be developed, implemented, measured, refined, and validated repeatedly over time.

Study 3 – Outcomes of Expected Performance and Peak Performance

Across various fields and contexts, there has been a longstanding interest in performance that has resulted in extensive literature addressing best practices for improving its management (Adler et al., 2016; Catano et al., 2015; Hays, 2009; Highhouse, 2008; Kornspan, 2007; Murphy, 2008; Privette, 1983; Privette & Landsman, 1983; Pulakos et al., 2015; Ravizza, 1977; Taylor, 1911). Although the most prominent area of focus has been on improving performance in the field of sports, peak performance has been applied successfully in a variety of scenarios in work and life (Bianco, 2010; Garfield, 1986; Hays, 2009; Kornspan, 2007; Privette, 1981, 1983, 1984, 2001; Privette & Bundrick, 1987, 1991; Privette & Landsman, 1983; Privette & Sherry, 1986; Ruiz et al., 2017). Approaches to understanding and characterizing peak performance resemble well-known theories applied in typical workplace settings, such as growth needs (Hackman & Oldham, 1976; Maslow, 1943, 1970a, b), core self-evaluations (Judge et al., 1997), and transformational leadership (Bass, 1985; Burns, 1978). As such, peak performance is a suitable construct to consider in similar scenarios in which traditional theories are applied.

Peak performance has emerged recently in the context of typical workplaces, mainly in executive coaching (Bianco, 2010; Hays, 2009; Robbins, 2020), making it relevant to explore its merits through a formal empirical framework. Study 1 focused on scale development, followed by scale confirmation and predictive validity analyses in Study 2. Because the peak attribute items were removed during Study 1, moderator analyses were conducted in Study 2. The idea is that positioning peak performance as a moderator is similar to assessing the internal attributes of the performer. In other words, detecting a moderating effect of peak performance could indicate that individuals with

certain attributes peak perform under certain conditions. This approach is a suitable treatment of peak performance attributes, which are positioned successfully in the individual zones of optimal functioning model for sports as an outcome moderator (Ruiz et al., 2017). The individual zones model asserts that an optimal level of pre-performance anxiety results in landing in the 'in-zone' of optimal functioning during an event (Ruiz et al., 2017). The internal processes that regulate pre-performance anxiety represent the internal attributes of the performer. The same approach has been used in a variety of workplace psychology theories and models, such as the core-self-evaluations approach (Judge et al., 1997), growth needs (Hackman & Oldham, 1976), and transformational leadership (Bass, 1985). Moderators in these approaches share qualities similar to peak attributes, such as being calm yet energized (Bass, 1985), being a good fit to the task (Hackman & Oldham, 1976), and having high self-confidence (Judge et al., 1997).

The first two studies revealed peak performance as a relevant construct with the potential to influence performance outcomes directly and to moderate the influence of task performance on performance outcomes. Given the limits of measuring counterproductive work behavior, the current study only includes task performance, organizational citizenship behavior, and peak performance. The premise of the current study is that task performance and organizational citizenship behavior are standard or expected performance styles (Borman & Motowidlo, 1997; Dunlop & Lee, 2004; Williams & Anderson, 1991), whereas peak performance is an optimal or exceptional performance style (Garfield, 1986; Hays, 2009; Privette, 1981). As such, the current study used an experimental design to assess the unique and combined effects of standard/expected performance (referred to as expected performance for the remainder of the paper) and peak performance on three important workplace decisions/outcomes:

acknowledgement worthiness (referred to in the remainder of the paper as acknowledgement), rewardability, and promotability (DePater et al., 2009; Sveinsdottir et al., 2016). The intent of the current study is to establish peak performance as a unique, relevant, and important performance style for predicting work outcomes. Demonstrating this successfully could reveal opportunities to predict and manage peak performance for research and practical purposes. Ultimately, the goal is to improve workplace performance management overall.

Expected Performance, Peak Performance, and Workplace Outcomes

Task performance and organizational citizenship behavior are longstanding and commonly accepted, measured, and supported facets of job performance (Borman & Motowidlo, 1997; Dunlop & Lee, 2004; Williams & Anderson, 1991). Combined, they are a good representation of what employees consider to be job performance standards and expectations in industry settings (Williams & Anderson, 1991), and meta-analysis results show they are highly related (Hoffman et al., 2007). Therefore, for the purpose of this study, *expected performance* is represented as a combination of task performance and organizational citizenship behavior (Borman & Motowidlo, 1997; Williams & Anderson, 1991). Task performance refers to the required tasks that are performed in a given job (Williams & Anderson; 1991) and include job-related tasks/behaviors that directly or indirectly relate to an organization's fundamental operations (Borman & Motowidlo, 1997). In particular, task performance refers to fulfilling the duties and responsibilities specified in a job description or completing assigned tasks that directly affect performance evaluations. Task performance also includes behaviors that support or hinder performance, such as attendance, appropriate use of work time, break duration, and an overall positive work attitude (Williams & Anderson, 1991).

Organizational citizenship behaviors are important workplace behaviors that notably influence an organization's effectiveness but are not necessarily directly job-related (Borman & Motowidlo, 1997). They are citizenship/prosocial behaviors that benefit others. Examples include being considerate and friendly toward coworkers, helpful toward new or absent employees, or supportive toward colleagues with heavy workloads (Williams & Anderson, 1991). Organizational citizenship behaviors involve offering assistance, passing along useful information to co-workers, taking personal interest in other employees, or listening to problems and worries of colleagues. They also include being respectful of organizational property and informal rules for maintaining order (Borman & Motowidlo, 1997; Williams & Anderson, 1991).

Comparatively, peak performance refers to superior human potential or functioning to achieve an exceptional outcome (Garfield, 1986; Privette, 1981). It is characterized by high levels of self-confidence and expectations of success, a calm and mindful command over a situation, keen focus on a task, a sense of determination, and a positive and dedicated attitude toward the goal. It is motivated by a unique fit between an individual and the work or industry culture that invokes an implicit desire to perform exceptionally well and to strive to be infallible. Having a high fit and desire to engage in the task, role, industry, etc. creates dedication to achieving an exceptional level of performance excellence. The connection resembles a deep emotional bond with the role/task/culture/industry that leads to striving for excellence or infallibility through mastering the human potential for the particular task (Privette, 1981). A peak performer strategically executes their work behavior through dedication and desire to build expertise. The result is performance that repeatedly hits the target predictably well. The

exceptional performance style that results from striving for excellence is what theoretically sets peak performance apart from expected performance (Garfield, 1986).

The current study tested the effects of expected performance and peak performance on three workplace decisions/outcomes: acknowledgement, rewardability, and promotability. *Acknowledgement* (i.e., praise and recognition) is a simple, cost-free, and effective method of recognizing employee performance and improving employee retention (Sveinsdottir et al., 2016). Acknowledgement is administered for a job well done, with the goal of reinforcing and encouraging continued effective performance (Sveinsdottir et al., 2016). *Rewardability* is a form of acknowledgement that the current study is treating as having a quantitative value associated with it, such as a paid day off or bonus payment (Sveinsdottir et al., 2016). Whereas acknowledgement can be administered freely, administering rewards likely involves a more semi-formal acknowledgement process. *Promotability*, the next tier of acknowledgement being considered in this study, refers to the extent to which someone is worthy of job advancement in the workplace because of their performance (DePater et al., 2009). In addition to *what* someone accomplishes at work and *how* someone performs their job, successfully overcoming challenging experiences is an important consideration for determining promotability (DePater et al., 2009).

Expected performance involves engaging in job-related and prosocial behaviors that lead directly or indirectly to desired job outcomes (Borman & Motowidlo, 1997; Williams & Anderson, 1991). Therefore, expected performance was anticipated to receive high ratings on acknowledgement, rewardability, and promotability. Similarly, peak performance characterizes exceptional job-related behaviors and also was expected to receive high ratings on acknowledgement, rewardability, and promotability.

Peak performance is an exceptional performance style that involves mastery of challenging situations. Although it might not be demonstrated or required in all instances of workplace performance, being a peak performer acts to moderate the outcomes of ordinary work tasks, as shown in Study 2. Therefore, the combination of expected performance and peak performance was expected to receive the highest ratings on acknowledgement, rewardability, and promotability compared to high expected performance alone or high peak performance alone. In Study 2, outcomes were job-based results. In the current study, the selected outcomes are external to the job tasks, being that they are decisions that are contingent on job-related results. This approach is an opportunity to examine the role of peak performance on external decision-based outcomes in workplace settings.

Study 3

In the current study, the peak performance scale developed in Study 1 and confirmed in Study 2 was used in an experimental design to show the effects of performance style (i.e., expected performance and peak performance) and performance consistency (i.e., inconsistent versus consistent) on ratings of acknowledgement, rewardability, and promotability. Each performance style was expected to have an effect on the outcomes, with the greatest effect expected to be produced by consistent expected performance and consistent peak performance combined. As the final study in the set, the current study aims to confirm that peak performance is a distinguishable and important performance style that can, and should, be measured in workplaces.

Hypotheses

Hypothesis 1. Expected performance directly affects acknowledgement, rewardability, and promotability ratings; ratings of outcomes will be higher for employees

described as having a consistent expected performance compared to inconsistent expected performance.

Hypothesis 2. Peak performance directly affects acknowledgement, rewardability, and promotability ratings; ratings of outcomes will be higher for employees described as having consistent peak performance compared to inconsistent peak performance.

Hypothesis 3. There will be an interaction effect of expected performance and peak performance on acknowledgement, rewardability, and promotability ratings; ratings on all three outcomes will be highest for employees described as having consistent expected performance and consistent peak performance.

Method

Participants

Participants were 146 (87 males, 58 females, and one other) working adults from the general North American population who ranged from 24 to 70 years of age (M = 40.5, SD = 10.2). Mean amount of work experience was M = 17.6 years (SD = 9.6 years). Participants were randomly assigned to read one of four possible hypothetical reference letters describing a person as an inconsistent or consistent expected performer and an inconsistent or consistent peak performer. The two performance consistencies and styles were manipulated into four treatment groups (i.e., 2x2 design; for the four groups, n = 37, n = 35, n = 36, and n = 38).

Procedure

Participants were invited directly by CloudResearch (formerly TurkPrime; Litman, Robinson, & Abberbock, 2016) to participate in an online study hosted by Qualtrics. The study invitation informed participants that they were being invited to participate in a research study about the effects of various performance styles on

important workplace decisions. Participants were compensated financially for their time. Payment was issued to them by CloudResearch upon successful completion of their participation.

Participants were informed that participation involved taking on the role of a hiring manager, reading a hypothetical employee reference letter, and then rating the employee's performance (i.e., expected performance and peak performance) and recognition worthiness (i.e., acknowledgement, rewardability, and promotability). Participants were informed that the study would take about 15-20 minutes to complete, that participation was voluntary and confidential, and that they could discontinue participation, at any time and without penalty, by closing their internet browser. They were informed that the study was approved by the Saint Mary's University Research Ethics Board and were provided with contact information, if they had any questions.

Willing participants clicked on a hyperlink in the invitation that directed them to the survey package containing an informed consent form, three demographic questions about themselves, one of four possible reference letters, and 38 survey items (i.e., 26 performance items, nine outcome items, and three validity-check items that asked participants to choose the 'neutral' response for those items). They were instructed to read the letter and then to rate the individual described in the letter on the survey items provided. Items were to be rated on a five-point Likert scale, ranging from 1 ('strongly disagree') to 5 ('strongly agree'). To enhance reader attentiveness, readers were asked to read carefully because they were not able to return to the letter after hitting "NEXT>>" (i.e., the "<<BACK" button was disabled). The intention was to reduce over-thinking and cross-referencing between the letter content and the survey items to the extent that the item ratings became suggestive. The final screen contained a feedback statement about

the study and information for obtaining study results (see Appendix D to review the survey package).

Research Design and Letter Development

An experimental design using vignettes was used to measure the effects of expected performance and peak performance on ratings of acknowledgement, rewardability, and promotability. An experimental design is suitable in early stages of construct development and validation, when it is more important to establish the existence and relevance of a construct, before being concerned with matters related to predictability, generalizability, or external validity (Kelloway, Barling, Kelley, Comtois, & Gatien, 2003). For the current study, the approach involved creating descriptions of inconsistent and consistent expected performance and peak performance. The two consistencies of the two performance styles were manipulated into a 2x2 design (see Appendix C): inconsistent expected performance and inconsistent peak performance (Letter 1), inconsistent expected performance and consistent peak performance (Letter 2), consistent expected performance and inconsistent peak performance (Letter 3), and consistent expected performance and consistent peak performance (Letter 4).

To ensure the letters were succinct, the letter content was based on the content of the measures of expected performance (Williams & Anderson, 1991) and peak performance. The four letters appeared identical, except for varying the statements to convey the performance consistency, whereby desirable performance behaviors either happened sometimes (i.e., inconsistent performance) or frequently (i.e., consistent performance). Combining both performance styles in each letter and only varying the consistency of each style ensured the letters appeared balanced with a wide range of workplace behaviors to consider. The idea was to optimize the face validity of the letters

by not appearing to be criterion deficient, had only one performance style been included per letter to describe either inconsistent or consistent expected or peak performance. Inconsistent and consistent were chosen as performance levels, rather than ‘almost never’ and ‘nearly always’, so that the employee being described seemed realistic, in order to not lead respondents to provide obviously low or high ratings on the outcome measures.

Measures

Participants completed demographic items that asked their age, gender, and work experience in years and months. After reading one of four randomly assigned hypothetical reference letters, they completed 38 survey items, including 21 expected performance items; five peak performance items; nine recognition outcomes (i.e., acknowledgement, rewardability, and promotability); and three validity-check items that asked participants to choose the ‘neutral’ response for those items. All items were rated on a five-point Likert scale from 1 (‘strongly disagree’) to 5 (‘strongly agree’).

Expected performance. Like the previous studies, the current study used the scale devised by Williams and Anderson (1991) to represent expected performance in this case. The 21-item scale measures in-role behavior, organizational citizenship behavior toward individuals, and organizational citizenship behavior toward the organization. For the current study, the scale was used as a unidimensional measure of expected performance, which was defined in the study to include task performance and organizational citizenship behavior. Cronbach’s (1951) alpha for the internal consistency reliability overall was reported as α = .83 (Williams & Anderson, 1991). For Study 1, alpha was α = .85 for task performance (i.e., the in-role behavior items) and α = .91 for organizational citizenship behavior. For the Study 2, for the sample of N = 174 respondents, alpha was α = .84 for the overall in-role scale, α = .63 for task performance

(i.e., the four behavior-based in-role items), α = .89 for organizational citizenship behavior, and α = .86 for performance outcomes (i.e., the three outcome-based in-role items). For the second sample of N = 186 respondents, alpha was α = .86 for the overall in-role scale, α = .70 for task performance, α = .87 for organizational citizenship behavior, and α = .83 for performance outcomes. For the current study, overall alpha was α = .95 for all 21 items.

Peak performance. The current study used the final five-item peak performance measure developed in Study 1 and confirmed in Study 2. Cronbach's (1951) alpha for the six retained items from Study 1 was α = .88. For Study 2, alpha for the six items was α = .88 for the sample of N = 174 respondents and α = .90 for the sample of N = 186 respondents. In study 2, an additional item was removed. Alpha for the resulting five items was α = .85 for the sample of N = 174 respondents and α = .87 for the sample of N = 186 respondents. For the current study, alpha was α = .90 for the five items.

Acknowledgement, rewardability, and promotability. Measures of acknowledgement, rewardability, and promotability often are based on formal reward systems or direct statements about worthiness (Sveinsdottir et al., 2016). Because the context and individual being rated are hypothetical, via fictitious reference letters, simple scales were developed that directly ask about acknowledgement, rewardability, and promotability. For the current study, Cronbach's (1951) alpha was α = .91 for the two acknowledgement items, α = .92 for the four rewardability items, and α = .93 for the three promotability items devised for this study.

Data Analysis Procedure

Data were screened and cleaned for univariate and multivariate outliers (IBM Corp., 2020). Based on Mahalanobis distances, data from a single participant were

deemed to be a significant multivariate outlier and were removed. Two outcomes were measured for manipulations validity checks (i.e., expected performance and peak performance measures were administered to assess that the two performance styles and consistencies were conveyed accurately in the letters). Three outcomes were measured to test the hypotheses (i.e., acknowledgement, rewardability, and promotability measures). Only the expected performance variable had a considerable amount of missing data when aggregated, which was due to the large number of items measuring expected performance (21 items) compared to peak performance (5 items) and the hypothesized outcomes (4 or fewer items each). After screening for univariate outliers, the omitted data affected the 21-item aggregate considerably (N = 118 for expected performance compared to N = 143 to 145 for the other measured outcomes). The reduced sample had a notable impact on group size, which ranged from n = 28 to n = 30 for the expected performance measure compared to n = 34 to n = 38 for the other outcome measures.

Because of the fairly small group sizes of the four treatment conditions, it was important to consider the impact of missing data on the aggregated expected performance scores. Some missing data and small differences in sample sizes are expected. However, particular caution was taken in the current study because the samples were small and the sample size differences were large for the expected performance scores. How to treat missing data has implications for inferential analyses. Once data were cleaned, the current study used a two-way multivariate analysis of covariance (MANOVA) to assess the validity of the manipulations, the hypotheses, and the effects of the covariates simultaneously (Tabachnick & Fidell, 2001). An assumption of MANCOVA is homogeneity of error variance of the outcome variables, which was expected to be violated because of the missing data and unequal sample sizes. Even without missing

data, error variance arguably is greater for expected performance measures compared to peak performance measures, because expected performance itself likely is more variable (i.e., a less range-restricted group fits this performance style). Comparatively, peak performance is exceptional and likely displayed by a more range-restricted group that varies less in performance execution and outcomes.

The missing data issue is complicated further by the findings from Study 2, which showed that peak performance moderates the influence of task performance on desired outcomes. The options were to have more authentic, variable, smaller, and uneven groups versus more artificial and range-restricted but larger and more even groups to compare, if the missing data were to be replaced. In order to decide how to proceed, five imputations of the dataset were generated for comparative purposes (IBM Corp., 2020). Means, standard deviations, bivariate correlations, and Cronbach's (1951) alpha were calculated for all measures used, including the five imputations (and pooled results) of the expected performance data. After assessing the options, the original expected performance data were chosen for the remaining analyses. Then, group-level descriptive statistics were computed and a two-way MANCOVA was conducted to test the validity of the manipulations, the hypotheses, and the effects of covariates simultaneously (Tabachnick & Fidell, 2001).

The covariates in the study were gender, age, and years/months of work experience. They were included in the MANCOVA to control for their effects on the results. Manipulation validity checks involved testing the manipulations in the hypothetical reference letters. In this case, the measures of expected performance and peak performance were positioned as outcomes. Scores on the outcomes were expected to correspond to the consistency of each performance style reflected in the letter assigned to

be read. In other words, employees described in the letters as inconsistent expected or peak performance should have significantly lower scores on the measures of expected or peak performance compared to employees described in the letters as consistent expected or peak performance. This signals that the rater brought the intended hypothetical employee to mind when rating the individual on the hypothesized outcome variables (i.e., acknowledgement, rewardability, and promotability). Finally, the hypotheses were tested to determine that performance style and consistency (i.e., the letter content) have an effect on ratings of acknowledgement, rewardability, and promotability. All analyses were conducted using SPSS (IBM Corp., 2020).

Results

Preliminary Analyses

For each measure used in the study and each imputation of the expected performance data, Table 3.1 contains means, standard deviations, sample size, Cronbach's (1951) alpha for internal consistency reliability, and bivariate correlations. Findings for Imputation 2 are rogue compared to the other imputations, including considerably lower bivariate correlations and alpha and an extremely high standard deviation. Conversely, the other imputations are quite similar to the original source data. This is expected, because the estimated values were derived from the dataset itself (IBM Corp., 2020). Although the original dataset has the smallest sample size, it produced the highest reliability coefficient being used in the study (α = .95). Therefore, there is no compelling evidence to use any of the data imputations. Other data replacement methods exist, such as replacement with the mean or mode, but the imputation method is more sophisticated, because it estimates the true score and error variance. Nonetheless, because of its limitations and no apparent benefit, the original data were deemed sufficient for

used in the remaining analyses. Bivariate relationships between the performance measures and the outcome measures were strong (r = .47 to r = .77, p < .01) and were even stronger between each of the three outcomes (r = .83 to r = .87). Cronbach's (1951) alpha was high for all measures used (α = .90 to α = .95).

Table 3.1

Descriptive and Inferential Statistics for the Study Measures

	Manipulations Checks – Expected and Peak Performance								**Hypothesized Outcomes**		
	Expected Performance Data Variations (21 items)										
	OD	**IM 1**	**IM 2**	**IM 3**	**IM 4**	**IM 5**	**PD**	**Peak** (5 items)	**Ack** (2 items)	**Rew** (4 items)	**Prom** (3 items)
Peak	.47*	.47*	.16**	.46*	.46*	.43*	.40				
Ack	.64*	.68*	.27*	.68*	.68*	.62*	.60	.66*			
Rew	.68*	.69*	.25*	.68*	.68*	.64*	.61	.72*	.84*		
Prom	.67*	.66*	.25*	.65*	.65*	.61*	.58	.77*	.83*	.87*	
Alpha *(α)*	.95	.94	.73	.94	.92	.79	–	.90	.91	.92	.93
***Mean* (1-5)**	3.94	3.83	3.57	3.84	3.83	3.87	3.79	3.46	3.63	3.11	3.29
SD	0.85	0.86	3.39	0.85	0.86	0.87	–	1.11	1.26	1.19	1.27
N	118	145	145	145	145	145	145	144	145	143	145

*p < .01; **p < .05 (two-tailed)
Note. Expected Performance Data Variations – Original Data (OD); Imputations (IM 1-5); Pooled Data (PD)
Peak = Peak Performance; Ack = Acknowledgement; Rew = Rewardability; Prom = Promotability

Homogeneity of error variance. Box's M test of the equality of the covariance matrices was significant, $F(45, 29481.55) = 3.49$, p < .01. Although significant, the sample sizes are unequal, making the test less robust (Tabachnick & Fidell, 2001). Levene's test also was significant for all five measured outcomes. As such, the assumption has been violated and results should be interpreted cautiously because of an unknown and inconsistent influence on the data.

Covariates. Gender, age, and years/months of work experience did not have a significant effect on the remaining analyses. As such, differences between the participants on the measured covariates did not have an influence on their ratings.

Manipulations validity checks. The main effects of expected performance and peak performance were significant, as was the interaction effect. The expected performance group had the highest effect (η^2 = .75, p < .001), followed by peak performance (η^2 = .52, p < .001), and then by the interaction, which was a much smaller effect (η^2 = .11, p < .05). For expected performance outcomes, R^2 = .73 (adjusted R^2 = .72). For peak performance outcomes, R^2 = .51 (adjusted R^2 = .48). A significant interaction indicates an unclean manipulation, but it shows that peak performance operates on other workplace factors to influence results. This is an unintended but not unforeseen finding, because Study 2 revealed the moderating influence of peak performance on task performance. Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root appear in Table 3.4 in the upcoming hypotheses section.

Table 3.2 shows that expected performance groups had the highest effect on the expected performance scores (η^2 = .71, p < .001), as did the peak performance groups on the peak performance scores (η^2 = .43, p < .001). However, the expected performance groups also had an effect on peak performance scores (η^2 = .11, p < .001), but the peak performance groups did not have an effect on the expected performance scores. The interaction effects also were significant but considerably smaller (η^2 = .07 and .08, p < .01). The crossing over of effects for the expected performance groups and the interaction effects indicate that the manipulation was not completely clean. However, the findings are consistent with the moderator results in Study 2 and do not hinder the intention of the current study.

Table 3.2

Overall Results of the Manipulations Validity Checks

Performance Groupings	Performance Scores	Type III Sum of Squares	*df*	Mean Square	*F*	*p*	Partial Eta Squared (η^2)
Expected	**Expected**	55.68	1	55.68	268.75	.000	0.71
	Peak	8.34	1	8.34	13.22	.000	0.11
Peak	**Expected**	0.03	1	0.03	0.13	.723	0.00
	Peak	51.29	1	51.29	81.31	.000	0.43
Expected x Peak	**Expected**	1.90	1	1.90	9.18	.003	0.08
	Peak	5.06	1	5.06	8.02	.006	0.07

Table 3.3

Descriptive Statistics for the Manipulations Validity Checks

Performance Groupings	Inconsistent Expected						Consistent Expected					
	Inconsistent Peak (A)			Consistent Peak (B)			Inconsistent Peak (C)			Consistent Peak (D)		
Outcomes	***Mean***	***SD***	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***	***n***
Expected	3.31	0.62	30	3.10	0.49	28	4.49	0.35	28	4.78	0.23	28
Peak	2.67	1.07	38	3.73	0.64	35	2.84	0.79	34	4.61	0.57	37

Table 3.3 shows descriptive statistics for the four study groups. For expected performance scores, the mean decreased from column A to B and then increased for columns C and D. For peak performance scores, the mean increased from column A to B, then decreased for column C, and then increased again for column D. The drop in expected performance outcomes (column B) and peak performance outcomes (column C) demonstrate the interactive/moderating effect. For expected performance scores, column B shows that consistent peak performers scored lower than inconsistent peak performers, even though the expected performance description in both groups was identical. The difference between columns B and D is considerably larger than for columns A and C for

the expected performance scores. For peak performance scores, column C shows that for inconsistent peak performers (columns A and C), there is very little difference in peak performance scores for inconsistent versus consistent expected performers. However, for consistent peak performers, there is a large difference in peak performance scores for inconsistent versus consistent expected performers. The difference between columns C and D is much larger than for columns A and B for the peak performance scores. These findings demonstrate the interactive/moderating effect of peak performance and an unclean manipulation.

Hypotheses 1, 2, and 3: Effects of Performance Style and Consistency

For the overall tests of significance, the main effect of expected performance on the performance outcomes overall (i.e., acknowledgement, rewardability, and promotability overall) was significant, $F(5, 104) = 61.48$, $p < .001$ ($\eta^2 = .75$), which supports Hypothesis 1. The main effect of peak performance overall also was significant, $F(5, 104) = 22.24$, $p < .001$ ($\eta^2 = .52$), which supports Hypothesis 2. Finally, the interaction effect overall was significant, $F(5, 104) = 2.48$, $p < .05$ ($\eta^2 = .11$), which supports Hypothesis 3. Table 3.4 summarizes the overall findings.

Table 3.4

Test Statistics for Overall Effects of Performance

Performance Groupings	Pillai's Trace	Wilks' Lambda	Hotelling's Trace / Roy's Largest Root	*F* (Exact Statistic)	Hypothesis *df*	Error *df*	*p*	Partial Eta Squared (η^2)
Expected	0.75	0.25	2.96	61.48	5	104	.000	0.75
Peak	0.52	0.48	1.07	22.24	5	104	.000	0.52
Expected x Peak	0.11	0.89	0.12	2.48	5	104	.037	0.11

As Table 3.5 shows, expected performance affects ratings of acknowledgement, rewardability, and promotability, which supports Hypothesis 1. For acknowledgement, $F(1, 108) = 46.93$, $p < .001$ ($\eta^2 = .30$); for rewardability, $F(1, 108) = 31.59$, $p < .001$ ($\eta^2 = .27$); for promotability, $F(1, 108) = 42.38$, $p < .001$ ($\eta^2 = .30$). Peak performance affects acknowledgement, rewardability, and promotability ratings, which supports Hypothesis 2. For acknowledgement, $F(1, 108) = 16.49$, $p < .001$ ($\eta^2 = .13$); for rewardability, $F(1, 108) = 30.36$, $p < .001$ ($\eta^2 = .22$); for promotability, $F(1, 108) = 37.94$, $p < .001$ ($\eta^2 = .26$). The interaction of expected performance and peak performance affects rewardability and promotability ratings but not acknowledgement ratings, which partially supports Hypothesis 3. For rewardability, $F(1, 108) = 7.16$, $p < .01$ ($\eta^2 = .06$); for promotability, $F(1, 108) = 7.44$, $p < .01$ ($\eta^2 = .06$); for acknowledgement, $F(1, 108) = 2.52$, $p > .05$, n.s. ($\eta^2 = .02$). For acknowledgement, $R^2 = .40$ (adjusted $R^2 = .37$). For rewardability, $R^2 = .47$ (adjusted $R^2 = .44$). For promotability, $R^2 = .51$ (adjusted $R^2 = .48$).

Table 3.5

Effects of Performance on the Workplace Outcomes

Performance Groupings	Outcome Scores	Type III Sum of Squares	*df*	Mean Square	*F*	*P*	Partial Eta Squared (η^2)
Expected	**Acknowledgement**	41.15	1	41.15	46.93	.000	.30
	Rewardability	31.59	1	31.59	40.31	.000	.27
	Promotability	42.38	1	42.38	53.76	.000	.33
Peak	**Acknowledgement**	14.46	1	14.46	16.49	.000	.13
	Rewardability	23.79	1	23.79	30.36	.000	.22
	Promotability	29.92	1	29.92	37.94	.000	.26
Expected x Peak	**Acknowledgement**	2.21	1	2.21	2.52	.115	.02
	Rewardability	5.61	1	5.61	7.16	.009	.06
	Promotability	5.86	1	5.86	7.44	.007	.06

Table 3.6

Descriptive Statistics for the Performance Outcomes

Performance Groupings	Inconsistent Expected						Consistent Expected					
	Inconsistent Peak (A)			Consistent Peak (B)			Inconsistent Peak (C)			Consistent Peak (D)		
Outcomes	***Mean***	***SD***	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***	***n***
Acknowledge	2.79	1.22	38	3.27	1.09	35	3.69	1.13	35	4.78	0.49	37
Reward	2.30	1.02	38	2.86	1.05	35	2.98	0.86	34	4.34	0.71	36
Promote	2.39	1.02	38	3.05	1.10	35	3.03	1.05	35	4.68	0.48	37

Table 3.6 shows descriptive statistics of the four study groups on the three hypothesized outcomes. Scores change in the expected direction for all groups, except for the ratings of column B compared to column C for promotability. The main effect of expected performance is noted in the change between columns A compared to C and B compared to D, which are the two comparisons during which peak performance was held constant. The main effect of peak performance is noted in the change between columns A compared to B and C compared to D, which are the two comparisons during which expected performance was held constant. The interactive effect of expected and peak performance also is noted in those columns, which show that the difference between inconsistent and consistent peak performance is much more pronounced when the individual is a consistent expected performer compared to an inconsistent expected performer. Specifically, the gains in scores from inconsistent to consistent peak performance are double when the individual already is a consistent expected performer compared to when the individual is an inconsistent expected performer. This moderated effect is significant for rewardability and promotability, but not for acknowledgement, although the mean differences are largely different (i.e., a change from $M = 2.79$ to $M =$

3.27 in peak scores for the inconsistent expected performance group versus a change from *M* = 3.69 to *M* = 4.78 in peak scores for the consistent expected performance group).

Discussion

Study 3 aimed to better understand the role of peak performance in making important organizational decisions, namely, those related to acknowledgement worthiness, rewardability, and promotability. An experimental design was used to assess the unique and combined effects of expected performance and peak performance on acknowledgement, rewardability, and promotability. Because task performance and organizational citizenship behavior are highly related, longstanding, commonly accepted, frequently measured, and well supported facets of job performance in the organizational literature, they were combined for the current study to represent expected performance (Borman & Motowidlo, 1997; Williams & Anderson, 1991).

Peak performance is a unique style that might not be required or demonstrated in all instances of workplace performance. Therefore, both expected and peak performance styles were assessed individually and simultaneously via the four hypothetical reference letters. The approach was designed to enhance the face validity of the letter reading and employee rating task by presenting letters that did not appear criterion deficient. Although expected performance and peak performance were hypothesized to each have a main effect on ratings of the measured outcomes, the highest ratings of acknowledgement, rewardability, and promotability were expected for employees described as having consistent expected performance and consistent peak performance, when compared to consistent expected performance or consistent peak performance alone.

Overall, the series of studies offers preliminary evidence of the relevance and usefulness of considering peak performance when making important workplace decisions.

The series begins with a theoretical overview of performance in workplace settings and across related settings. The goal was to address criterion deficiency in workplace measurement of job performance by exploring how its measurement is approached in the related literature. In doing so, peak performance stood out as a viable complementary conception that is prominent in the broader field of performance psychology, particularly sport psychology (Hays, 2009; Privette, 1983; Privette & Landsman, 1983; Ravizza, 1977). Evidence of its uniqueness in relation to life-event constructs, such as peak experiences, flow, failure, and misery, has been generated by social, personality, and humanistic psychology researchers (Privette & Bundrick, 1987, 1991). Over the years, peak performance has been applied broadly to sports, performing artists, high-risk/high-reliability industries, and executive coaching (Bianco, 2010; Hays, 2009; Robbins, 2020), which inspired the development of the peak performance scale for use in more typical workplace settings.

Although informative, Study 1 results were based on a relatively small sample of student responses. The study involved conceptualizing peak performance, conducting exploratory analyses on a newly-developed peak performance measure, and examining how peak performance relates to the well-established concepts of task performance, organizational citizenship behavior, and counterproductive work behavior. In order to validate the resulting framework, Study 2 involved conducting confirmatory analyses and preliminary construct validity analyses on the refined peak performance measure from Study 1. Study 2 used data from working adults in the general population; it included behavior measures and an outcome measure for completing predictive, redundancy, moderator, and relative weights analyses; and it repeated all analyses on two independent groups of working adults to demonstrate stability.

From Studies 1 and 2, a basis was established to consider testing peak performance outcomes in a workplace context. Because the peak attributes scale was omitted in Study 1, moderator analyses helped to establish that internal/underlying processes influence behaviors that lead to various performance outcomes (Hackman & Oldham, 1976; Judge et al., 1997; Ruiz et al., 2017). The Study 2 inclusions supported the assertion that peak performance is a unique predictor of performance outcomes, adding further legitimacy to continuing onto Study 3. The overall intention of the series was to confirm that peak performance is a unique, relevant, and important performance style for predicting various work-related outcomes in research and practical settings.

Review of the Results

A large number of expected performance items were aggregated into a composite score to be used during the manipulations validity checks. This resulted in uneven sample sizes across test groups for the expected performance outcome data. Although uneven sample sizes that result from missing data are common in research studies, the concern in the current study was due to the considerably small sample sizes and the relatively large sample size differences across the treatment groups. However, imputations of the existing data did not yield noteworthy reasons for replacing the missing data. Box’s M test of the equality of the covariance matrices was significant, although unequal sample sizes make the test less robust (Tabachnick & Fidell, 2001). Levene's test also was significant for all five outcomes measured (i.e., two for the manipulations validity checks and three to test the hypotheses). Therefore, both tests show that the assumption of homogeneity of error variance has been violated and results should be interpreted with caution. Gender, age, and years/months of work experience did not have significant effects on the remaining analyses for any of the five outcome measures.

For the manipulations validity checks, the main effects of expected performance and peak performance were significant, but so was the interaction effect. The effect was highest for expected performance, followed by peak performance, and then by the interaction. Although the significant interaction indicates an unclean manipulation, it demonstrates that peak performance influences other workplace behaviors in certain conditions. A similar result was found in Study 2 and could be why homogeneity of error variance was violated in the current study. All groups differed on their corresponding measured outcomes, except for the peak group on expected performance outcomes. The expected performance groups had the highest effect on expected performance scores, as did peak performance groups for peak performance scores. Means for each group show the scores changing in the expected direction for all groups, except for the ratings of expected performance for the inconsistent expected performers. In this case, the ratings of inconsistent expected performers dropped when the peak performance was consistent.

For the hypotheses, the main effects of expected performance and of peak performance on the performance outcomes (i.e., acknowledgement, rewardability, and promotability overall) were significant overall and for all three outcomes, supporting Hypotheses 1 and 2. The interaction effect was significant overall and for rewardability and promotability, but not acknowledgement, which mostly supports Hypothesis 3. Scores change in the expected direction for all groups, except for the ratings of promotability. The interactive effect of expected performance and peak performance shows the pronounced difference between inconsistent and consistent peak performance when the individual is a consistent versus inconsistent expected performer. Gains in rewardability and promotability scores doubled for consistent expected performers compared to inconsistent expected performers, when comparing inconsistent to consistent

peak performers. Therefore, for inconsistent expected performers, there is only some gain if peak performance consistent versus inconsistent. Comparatively, for consistent expected performers, the gain is much larger for consistent versus inconsistent peak performers. This is why it becomes important to retain and nurture consistent expected performers with suitable roles and peak performance training and support.

Limitations and Implications for Research and Practice

The current study obtained data from general population participants with various work backgrounds. However, the experimental design and suitable external outcome measures helped to control the workplace variability that was present in the first two studies (DePater, VanVianen, Bechtoldt, & Klehe, 2009; Sveinsdottir, Ragnarsdottir, & Blondal, 2016). Nonetheless, with experimental designs, control is at the expense of generalizability. In this case, real-life employees likely do not fall into the four discrete and neatly defined categories suggested in this study. Moreover, the current peak performance measure is a five-item unidimensional scale that appears relevant and succinct but could be deficient. During the development process, four peak attributes items, an item measuring concentration at work (intended to measure mindfulness), and a commitment item were removed. Throughout the series of studies, it became clear that peak performance attributes could be understood better based on the moderating aspect of peak performance behaviors. Extensive research across fields supports the approach of positioning internal drivers of behavior as moderators (Andersen, 2009; Bianco, 2010; Gould, 2009; Hackman & Oldham, 1976; Hallett, 2011; Hallett & Hoffman, 2014; Jokela & Hanin, 1999; Judge et al., 1997; Maslow, 1943, 1970a, b; Ruiz et al., 2017).

In terms of content, although it might be difficult to measure internal processes accurately, it should not be overlooked. It is important to understand *why* someone is

behaving at work in a particular way, if interventions and performance enhancement training is to be implemented and transferred effectively (Borman & Mahar, 2018). For instance, attempting to measure counterproductive work behavior was problematic for the first two studies, possibly because the questions on the measure used are too literal. It is more likely that undesirable factors that influence work performance are considerably prevalent but more subtle (Bolino, Klotz, Turnley, & Harvey, 2013). For instance, organizations need a deeper understanding of the conditions under which organizational citizenship behaviors do more harm than good, which requires a more nuanced view of organizational citizenship behaviors that highlights its 'dark side' (Bolino et al., 2013). For example, managers might use a compulsory or coercive approach to impose voluntary or extra-role activities, leading subordinates to engage in organizational citizenship behaviors because of social pressure instead of by choice or out of good will (Vigoda-Gadot, 2006).

In terms of measurement accuracy, organizational citizenship behavior and counterproductive work behavior essentially have been treated as a dichotomy of desirable and undesirable workplace behaviors, respectively. It is possible however that the dichotomy exists *within* each of these dimensions (Borman & Mahar, 2018). Specifically, organizational citizenship behavior can be desirable (i.e., sincere, productive, supportive) or undesirable (i.e., insincere, unproductive, unsupportive). Likewise, counterproductive work behaviors can be intentional (e.g., choosing to be absent without caring) or unintentional (e.g., forced to be absent because of competing demands). In these cases, ulterior motives are driving the behaviors (i.e., internal drivers that become performance moderators). As such, to measure the degree of engagement in *ulterior performance*, its essence needs to be imbedded into existing conceptions

(Borman & Mahar, 2018). For example, it is not sufficient to ask if someone is friendly at work. The more important question is whether their friendliness is sincere, supportive, and productive, or whether it causes reduced performance because it is seen as fake, selective, or used as a diversion from required tasks. Similarly, for counterproductive work behaviors, an employee who is repeatedly tardy due to their child having health issues, for example, is incongruent with an employee that is flippant about tardiness or extra long lunch breaks. This is why internal states need to be considered, because they act to enhance or hinder optimal performance.

Future Directions

Perhaps what sets high peak performers apart from average expected performers is their ability to take command of internal states and the factors that affect them, as suggested by various researchers and practitioners in the theories that have been highlighted throughout this series. This offers opportunities to consider the characteristics that determine such command, which might form the basis of a more comprehensive study and multidimensional scale for broader use. Notable individual characteristics to consider include expertise, work passion, mindfulness/resilience, and motivation/self-efficacy. Role-level factors include job design and role demands. Organization-level factors include culture and leadership. Finally, external factors are important to consider, such as how consumer experience influences employee performance.

Individual characteristics. Peak performance involves engaging in deliberate practice and mental representations of knowledge, skills, and abilities to develop expertise. The formation of mental representations is a process of encoding external stimuli into an individual's physiology at the neuronal level, such as picturing something long enough to form a memory of that mental image. Through deliberate practice, strong

mental representations of the task are formed and peak performance can be achieved (Ericsson & Paul, 2016). Therefore, in situations that require rapid decision making, experts tend to yield the correct solution, without needing to compare their choice to alternate options (Klein, Calderwood, & Clinton-Cirocco, 2010). Recognition-primed rapid decisions emphasize recognition, rather than calculation or analysis, which is enhanced through deliberate practice and mental representations (Klein et al., 2010). Similarly, numerous studies have established a strong positive correlation between general cognitive ability and skill acquisition (e.g., Ackerman, 1987, 1992; Lohman, 1999) and between cognitive ability and job training success (Ree & Caretta, 1998; Schmidt, 2002). General cognitive ability is the single best predictor of overall job performance (Schmidt, 2002). However, the skills that are acquired mediate the relationship between it and training transfer (Colquitt, LePine, & Noe, 2000). This suggests that skills training alone may not be enough to generate peak performances. Rather, other predictors might need to be present for the transfer to happen, which might be factors that operate internally (e.g., work passion, mindfulness, or self-efficacy).

Work passion refers to having a strong inclination toward a desired, important activity in which time and energy are invested (Zigarmi, Galloway, & Roberts, 2018). Considerable work has been done in very recent years in the area of work passion and the distinction between harmonious passion and obsessive passion (Birkeland, Richardsen, & Dysvik, 2018; Lavigne, Forest, Fernet, & Crevier-Braud, 2014; McAllister, Harris, Hochwarter, Perrewé, & Ferris, 2017; Pradhan, Panda, & Jena, 2017; Zigarmi et al., 2018). A recent longitudinal study determined that harmonious passion relates to reduced exhaustion and cynicism over time, whereas obsessive passion relates to increased exhaustion and cynicism over time and can reduce the effectiveness of support (Birkeland

et al., 2018). Furthermore, internal locus of control more so contributes to harmonious passion, whereas external locus of control more so contributes to obsessive passion (Zigarmi et al., 2018). In another longitudinal study, harmonious passion for work led to positive evaluations of job control and support and low levels of work overload. Conversely, obsessive passion led to low evaluations of job control and support and increased perceptions of work overload (Lavigne et al., 2014). Peak performers achieve exceptional outcomes, possibly because they are experts who experience harmonious passion for their work, either by finding conditions that lead to passion or by creating them by building resilience through mindfulness exercises.

The basis for applying mindfulness is in resiliency theory, which involves having command over emotional responses to stressful situations through regulating the nervous system and calming the body's fear receptors (Hendricks & Plummer, 2015). Chronic stress due to a lack of command over emotional responses can be extremely harmful over time. Problems include exacerbated health conditions, taxed working memory capacity, and behavioral or emotional problems, such as diminished focus and emotional instability (Hendricks & Plummer, 2015). During the practice phase needed to become an expert, mindfulness is particularly relevant for mental representations and, ultimately, accurate decision making, particularly when under pressure. Interventions build resiliency to such stressful role demands (van der Kolk, 2014). Initiatives help to reduce stress and anxiety and improve mood recovery (Jouper & Johansson, 2012). Peak performers are characterized as mindful and resilient, making them more likely to generate successful performance outcomes in situations that typically invoke stressful responses (Krane & Williams, 2006).

Along with expertise, complex jobs involve having high self-efficacy in order to become motivated (Tabernero & Wood, 2009). Self-efficacy refers to belief in one's own capability to perform effectively (Bandura, 1991). A meta-analysis revealed a validity coefficient of r = .37 for self-efficacy predicting job performance (Judge, Jackson, Shaw, Scott, & Rich, 2007). Expectations of personal mastery are the primary drivers of behavioral change, and past successes being attributed to skill versus chance can influence future self-efficacy expectations (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982). When self-efficacy depends on skills and abilities, it determines motivation, which mediates the relationship between self-efficacy and performance (Tabernero & Wood, 2009). As such, individuals high in self-efficacy choose challenging tasks to maximize learning opportunities, a likely approach for a peak performer, who is mindful, attentive, and seeking to become an expert (Hays, 2009).

When training for a given career, being in one's chosen job (i.e., harmonious passion) gives trainees more autonomy over career progressions that align with personal goals. More autonomy supports pre-training attitudes of self-efficacy and training motivation, with direct effects on training transfer motivation and indirect effects on knowledge acquisition and post-training self-efficacy (Patrick, Smy, Tombs, & Shelton, 2012). Therefore, peak performers arguably have high self-efficacy, an attribute that can be targeted during selection or training. At the very least, active measures should be taken to ensure self-efficacy is not reduced, which typically can be managed at the role and organization level and enhanced further by the client's experience.

Role, organizational, and external factors. Role factors play a large part in performance effectiveness, which is the basis of the relationship between growth needs and job characteristics outlined in the job characteristics theory (Hackman & Oldham,

1976). Essentially, the theory is the first theory of fit of its kind. It has helped to explain why individuals vary in their performance as a result of the fit between the role characteristics and their need for simple, medium, or complex jobs to perform at their best. If not, negative role factors begin to be experienced, such as role ambiguity and overload. A meta-analysis revealed a negative relationship between role ambiguity and job performance, which is moderated by job type and rating source (Tubre and Collins, 2000). For role overload, an examination of the relationships among job characteristics, exhaustion, and performance determined that job demands are strong antecedents of exhaustion, performance reduction, and disengagement (Bakker, Demerouti, & Verbeke, 2004). However, motivation mediates the relationship between emotional exhaustion and job performance (Halbesleben & Bowler, 2007).

In general, with respect to work stressors, a meta-analysis of the relationships among stressors and strains, motivation, and performance demonstrated that hindrance stressors directly and negatively affect performance. Hindrance stressors also indirectly and negatively affect performance through strains and motivation. Conversely, challenge stressors directly and positively affect performance and offset the effect of strains (negatively) and motivation (positively) on performance (Lepine, Podsakoff, & Lepine, 2005). This finding resembles the individual zones of optimal functioning model in sports, which has demonstrated that an optimal pre-competition zone enhances performance (Ruiz et al., 2017). It is clear that expertise, passion, mindfulness/resilience, and motivation/self-efficacy all play a role in how these role factors are experienced. In general, understanding all of these relationships simultaneously will help to build a model of peak performance selection, training, and appraisal, which is both possible and optimal, with support at the organizational level.

Organizational factors, such as culture and leadership, are at the fundamental attitudinal root of organizations, and peak performers have a high need for fit in a role. Therefore, it might be worth assessing the impact of organizational culture on peak performance, particularly because few studies have shown the positive relationship between organizational culture and employee performance (Ramlall, 2008; Shahzad, Iqbal, & Gulzar, 2013). Similarly, across a wide variety of leadership styles, leadership has a direct, positive influence on individual and group performance (Bass, 1999; Cohen, 1992; MacKenzie, Podsakoff, & Rich, 2001). This is especially true for transformational leadership (Howell & Avolio, 1993), even when the delivery is remote, such as by email (Kelloway et al., 2003). Leadership in organizations is analogous to team coaches in sports or to executive coaches in business. Therefore, the influence of leadership style on peak performance should be explored, particularly leader feedback style, which can have damaging effects on individuals with low self-efficacy, especially if the feedback is negative and person-focused rather than task-focused (Kluger & DeNisi, 1996; Smither, London, & Reilly, 2005). Peak performers have greater resilience when receiving feedback, are not prone to emotional damage from person-focused feedback, and thrive even further on task-focused feedback, which is how they build their expertise (Kluger & DeNisi, 1996; Smither et al., 2005).

A final piece of feedback that should be considered is the client's reactions to their experience (Hughes, 2014; Myrden, & Kelloway, 2015). The function of performance is to deliver a product, service, or experience, which presumes a receiver/consumer, but consumer reactions tend to be the domain of market research (Myrden, & Kelloway, 2015). Peak performance is a performance psychology construct that often has an audience associated with it. Perhaps, we all have an audience to consider, such as

customers, clients, and even our supervisors, if our work is an indirect contribution to an end state (e.g., maintenance staff). As such, we should consider measuring consumer experience as a driver of peak performance, just as our performance drives their behavior (Hughes, 2014; Myrden, & Kelloway, 2015). In the performing arts[1] and in service industries, which are dynamic in nature, audience reactions occur frequently and fluctuate rapidly; an efficient and accurate performance that is monitored and adjusted frequently is necessary for achieving positive consumer reactions (Hughes, 2014; Myrden, & Kelloway, 2015), For example, daily transformational leadership behaviors positively influence daily job satisfaction and employee engagement, which subsequently influence customer perceptions of quality, their satisfaction, and their loyalty (Myrden, & Kelloway, 2015). Because peak performers share similar attributes to transformational leaders (Bass, 1985; Garfield, 1986), the roles of peak performance and consumer reactions are relevant considerations in workplace settings,

Concluding Remarks

The intention of this dissertation was to demonstrate the relevance and usefulness of considering peak performance when making important workplace decisions. A viable measure was developed and confirmed for use in Study 3, which used an experimental design to show the effects of expected performance and peak performance on acknowledgement, rewardability, and promotability in most cases. The moderating effect

[1] I once had an exchange about this with Glenn Hughes, who has come to be known as the Voice of Rock and is a 2016 Rock and Roll Hall of Fame inductee for his work with Deep Purple. The conversation was under a photo he posted on his Facebook page of him with Slash (of Guns N' Roses) performing for a massive audience. I commented that seeing that audience made me wonder if that's the key factor involved in peak performance and asked about the symbiotic energy. His reply was, "Audience is über important. We both give back to each other." (Facebook post, April 26, 2014).

of peak performance was apparent during the manipulations validity checks and hypothesis tests. This was helpful because of the difficult but necessary task of measuring internal processes. For interventions to be effective, it is important to understand *why* someone is behaving at work in a particular way. This was apparent when measuring counterproductive work behavior and possibly an issue with measuring organizational citizenship behaviors, which also have a 'dark side' (Bolino et al., 2013).

Because we understand that peak performers take command of internal states and the factors that affect them, we can consider the characteristics that facilitate such a command. From there, a more comprehensive study could be conducted to assess the predictors of peak performance and a multidimensional scale could be developed for broader use in research and practice. To better understand how various factors are associated with peak performance, future research should focus on individual characteristics, such as expertise, work passion, mindfulness/resilience, and motivation/self-efficacy; role-level factors, such as job design and role demands; organization-level factors, such as organizational culture and leadership style; and external factors, such as consumer experience. Ideally, this would be accomplished in a real-life workplace context, such as to validate a training program.

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Appendix A – Surveys Used in Studies 1 and 2

Study 1 – Job Performance (B and O)
Study 2 – Task Performance (B) and Job Performance Outcomes (O)
Studies 1 and 2 – Organizational Citizenship Behavior (OCB)
(Williams & Anderson, 1991)

Items were to be rated on a five-point Likert scale:
1 = Strongly disagree
2 = Somewhat disagree
3 = Neither agree nor disagree
4 = Somewhat agree
5= Strongly agree

The person I am rating...
(B) Performs tasks that are expected of him/her.
(B) Engages in activities that will directly affect his/her performance evaluation.
(B) Neglects aspects of the job he/she is obligated to perform. (R)
(B) Fails to perform essential duties (R)
(O) Adequately completes assigned duties.
(O) Fulfills responsibilities specified in job description.
(O) Meets formal performance requirements of the job.
(OCB) Helps others who have been absent.
(OCB) Helps others who have heavy workloads.
(OCB) Assists supervisor with his/her work (when not asked). (Original)
Assists his/her own supervisor with their work (when not asked). (Modified)
(OCB) Takes time to listen to co-workers' problems and worries.
(OCB) Goes out of way to help new employees.
(OCB) Takes a personal interest in other employees.
(OCB) Passes along information to co-workers.
(OCB) Attendance at work is above the norm. (Original)
Has attendance at work that is above the norm. (Modified)
(OCB) Gives advance notice when unable to come to work.
(OCB) Takes undeserved work breaks. (R)
(OCB) Great deal of time spent with personal phone conversations. (R; Original)
Spends a great deal of time with personal phone conversations. (R; Modified)
(OCB) Complains about insignificant things at work. (R)
(OCB) Conserves and protects organizational property.
(OCB) Adheres to informal rules devised to maintain order.

Studies 1 and 2 – Counterproductive Work Behavior (Spector et al., 2006)

Purposely failed to follow instructions.
Comes to work late without permission.
Purposely has done his/her work incorrectly.
Purposely dirtied or littered his/her place of work.
Has left work earlier than he/she was allowed to.
Has taken a longer break he/she was allowed to take.
Has stolen something belonging to someone at work.
Has taken supplies or tools home without permission.
Purposely wasted his/her employer's materials/supplies.
Has put in to be paid for more hours than he/she worked.
Has purposely damaged a piece of equipment or property.
Has taken money from his/her employer without permission.
Has purposely worked slowly when things needed to get done.
Has stayed home from work and said he/she was sick when he/she was not.

Original Peak Performance Items Devised for Study 1 – Attributes (A) and Behaviors (B)

(A) Acts energized and yet relaxed at work.
(A) Acts like he/she feels in control at work.
(A) Acts like he/she expects to be successful at work.
(A) Thinks about performance with a positive attitude.
(B) Acts like he/she feels high levels of self-confidence at work.
(B) Acts highly committed at work.
(B) Acts highly determined at work.
(B) Gets keenly focused on the task at hand.
(B) Has demonstrated incidences of complete levels of concentration at work.
(B) Has demonstrated superior use of human potential during a work situation.
(B) Has demonstrated an incidence of superior functioning during a work situation.

Appendix B – Online Survey Package for Studies 1 and 2

Informed Consent Form
Study 1 – Exploratory Analysis of Peak Performance
Saint Mary's University Research Ethics Board #15-335

Tammy Mahar, Student Investigator (E-mail: Tammy.Mahar@smu.ca)
Dr. Vic Catano, Supervisor (E-mail: Vic.Catano@smu.ca; Phone: 902.420.2845)
Saint Mary's University, Psychology Department
923 Robie Street, Halifax, Nova Scotia, B3H 3C3
Phone: 902.420.2846 Fax: 902.496.8287

This research study is being conducted by Tammy Mahar, a Ph.D. student in the Psychology Department at Saint Mary's University (SMU). The study is part of the Ph.D. program requirements and has been reviewed and approved by the SMU Research Ethics Board (REB #15-335). If you have any questions or concerns about ethical matters, please contact Dr. Jim Cameron, Chair for the REB, at ethics@smu.ca or 902.420.5728. Otherwise, you may contact Tammy at tammy.mahar@smu.ca or Dr. Vic Catano at vic.catano@smu.ca.

You are being invited to participate in a voluntary research study about the nature of job performance. Workplaces use job performance ratings to make critical decisions, such as to decide on promotions or dismissals. Results of this study will help to improve decision-making effectiveness. Participation involves thinking of a past or current workplace and answering questions as honestly as possible about your own and your immediate supervisor's job and job performance styles. The study requires up to 30 minutes of completion time. You may skip any questions that you do not wish to answer or discontinue at any time and without penalty by closing your internet browser. However, if you complete the full process, to thank you for participating, you will receive 0.5 bonus points, as per regulations specified by the SONA system for up to 30 minutes of online study participation.

The study involves no foreseeable risks. Participation is completely anonymous because no personally identifying information needs to be provided. Furthermore, only the student investigator will be analyzing the collected data, and results will be presented in a group format, thereby assuring your anonymity and confidentiality. Data collected via this online platform, Qualtrics, are stored on a secure server in Ireland and not shared with third parties. Electronic data retrieved by the student investigator for analysis will be stored securely on campus at SMU, once the study is complete. Results of the study will be available by May 1, 2016. You may request a summary of the results by e-mail at tammy.mahar@smu.ca.

By continuing onto the study, you are indicating that you understand what this study is about, appreciate the risks and benefits, consent to taking part in this research study, and do not waive any rights to legal recourse in the event of research-related harm. Furthermore, you are indicating that you have had adequate time to think about the research study, have had the opportunity to ask questions, and understand that participation is voluntary and can be discontinued at any time without penalty.

Informed Consent Form
Study 2 – Confirmatory Analysis of Peak Performance
Saint Mary's University Research Ethics Board #15-335

Tammy Mahar, Student Investigator (E-mail: Tammy.Mahar@smu.ca)
Dr. Vic Catano, Supervisor (E-mail: Vic.Catano@smu.ca; Phone: 902.420.2845)
Saint Mary's University, Psychology Department
923 Robie Street, Halifax, Nova Scotia, B3H 3C3
Phone: 902.420.2846 Fax: 902.496.8287

This research study is being conducted by Tammy Mahar, a Ph.D. student in the Psychology Department at Saint Mary's University (SMU). The study is part of the Ph.D. program requirements and has been reviewed and approved by the SMU Research Ethics Board (REB #15-335). If you have any questions or concerns about ethical matters, please contact Dr. Jim Cameron, Chair for the REB, at ethics@smu.ca or 902.420.5728. Otherwise, you may contact Tammy at tammy.mahar@smu.ca or Dr. Vic Catano at vic.catano@smu.ca.

You are being invited to participate in a voluntary research study about the nature of job performance. Workplaces use job performance ratings to make critical decisions, such as to decide on promotions or dismissals. Results of this study will help to improve decision-making effectiveness. Participation involves thinking of a past or current workplace and answering questions as honestly as possible about your own and your immediate supervisor's job and job performance styles. The study requires up to 30 minutes of completion time. You may skip any questions that you do not wish to answer or discontinue at any time and without penalty by closing your internet browser.

The study involves no foreseeable risks. Participation is completely anonymous because no personally identifying information needs to be provided. Furthermore, only the student investigator will be analyzing the collected data, and results will be presented in a group format, thereby assuring your anonymity and confidentiality. Data collected via this online platform, Qualtrics, are stored on a secure server in Ireland and not shared with third parties. Electronic data retrieved by the student investigator for analysis will be stored securely on campus at SMU, once the study is complete. Results of the study will be available by May 1, 2016. You may request a summary of the results by e-mail at tammy.mahar@smu.ca.

By continuing onto the study, you are indicating that you understand what this study is about, appreciate the risks and benefits, consent to taking part in this research study, and do not waive any rights to legal recourse in the event of research-related harm. Furthermore, you are indicating that you have had adequate time to think about the research study, have had the opportunity to ask questions, and understand that participation is voluntary and can be discontinued at any time without penalty.

Demographic Questions

Instructions: Please bring to mind your present job and immediate manager/supervisor, and then answer the following questions about yourself, your job, and your manager/supervisor.

About yourself:

1. What is your gender? _____ Male _____ Female

2. What is your year of birth? _____

3. What is your highest level of education?

_____ 1. Grade school
_____ 2. High school graduate
_____ 3. Some college
_____ 4. College graduate
_____ 5. Some university
_____ 6. University undergraduate degree
_____ 7. Some graduate work
_____ 8. University graduate degree

About your job:

1. Approximately how many hours per week do you work at your job? _____

2. Which industry best describes your job?

_____ 1. Development, Construction, Renovation, Maintenance
_____ 2. Business Applications, Communications, Secretarial
_____ 3. Grocery, Department Store, Merchandising, Sales
_____ 4. Computers, Computer Applications, Electronics
_____ 5. Transportation, Moving, Storage, Warehousing
_____ 6. Military, Government, Public Services, Charity
_____ 7. Medical, Pharmaceutical, Physiotherapy
_____ 8. Fitness, Sports, Recreation, Fine Arts
_____ 9. Banking, Financing, Leasing
_____ 10. Child Care, Personal Care
_____ 11. Entertainment, Gaming
_____ 12. Tourism, Hospitality
_____ 13. Food, Beverage
_____ 14. Manufacturing
_____ 15. Dry Cleaning
_____ 16. Aesthetics
_____ 17. Petroleum
_____ 18. Education
_____ 19. Security
_____ 20. Trade
_____ 21. Floral
_____ 22. Farming/Dairy
_____ 23. Other: _____

3. Which job title best describes you?

_____ 1. Manager
_____ 2. Employee
_____ 3. Supervisor
_____ 4. Assistant
_____ 5. Assistant Manager
_____ 6. Assistant Coach
_____ 7. Junior Officer
_____ 8. Volunteer
_____ 9. Coordinator
_____ 10. Other (please _____

About your manager/supervisor:

1. What is your manager/supervisor's gender? _____ Male _____ Female

2. What is your manager/ supervisor's approximate age?
___ 20s ___30s ___40s ___50s ___60s ___70s ___80s+

3. What is your manager/supervisor's job title?

_____ 1. Owner
_____ 2. Manager
_____ 3. Supervisor
_____ 4. Director
_____ 5. Assistant Director
_____ 6. Assistant Manager
_____ 7. Coordinator
_____ 8. CEO
_____ 9. Vice President
_____ 10. Division Head
_____ 11. Administrator
_____ 12. Senior Officer
_____ 13. Group Leader
_____ 14. Head Coach
_____ 15. Professor
_____ 16. Chairperson
_____ 17. Volunteer
_____ 18. Other (specify below):
_____

4. For how long have you worked for your manager/supervisor? ____ Years ___ Months

5. For how long have you known your manager/supervisor? ____ Years ___ Months

6. Job Performance Survey Items
Randomized set of the 64 job performance survey items outlined in Appendix A.

Feedback Form

THANKS FOR PARTICIPATING!

Feedback about the Study…

This study on job performance is being conducted to determine if the job performance construct should be broadened to include concepts not traditionally measured in organizational research. Better understanding of the nature of job performance leads to improved selection, training, and promotion practices in various industries and organizations.

Study results will be available by May 1, 2016. You may request a summary by e-mailing tammy.mahar@smu.ca. If you have any questions or concerns about ethical matters, you may contact Dr. Cameron, Chair for the Research Ethics Board, at ethics@smu.ca. Otherwise, you may contact me at tammy.mahar@smu.ca or Dr. Catano at vic.catano@smu.ca.

Appendix C – Hypothetical Reference Letter Content for Study 3

Inconsistent Expected/Standard Performance

Overall, TE does fairly well at meeting the requirements of the job. TE generally performs the required tasks and duties in their job description, but does not always address issues that directly affect their performance evaluations. As for attendance, TE is normally not absent, but has given short notice for time off and has misused work and break time occasionally to tend to personal matters.

In general, TE is pleasant to have in the workplace and is considerate and friendly toward colleagues. However, TE isn't necessarily the type to be helpful toward new or absent employees or supportive toward colleagues with heavy workloads. For instance, I have never noticed TE offer assistance and pass along useful information to co-workers, without being asked.

TE generally seems to be respectful toward employees and the workplace. However, TE does not seem like the type to take personal interest in other employees or listen to their problems and worries. Nonetheless, I have never observed TE be disrespectful of the workplace property or informal workplace rules and norms. Overall, TE has a satisfactory work attitude.

Consistent Expected/Standard Performance

Overall, TE does well at meeting the requirements of the job. TE is careful to perform the required tasks and duties in their job description, and is sure to address issues that directly affect their performance evaluations. As for attendance, TE is almost never absent and is considerate about giving ample notice for time off. TE uses work time appropriately and refrains from misusing break time or work time to tend to personal matters.

In general, TE is pleasant to have in the workplace and is quite considerate and friendly toward colleagues. TE is the type to be helpful toward new or absent employees and supportive toward colleagues with heavy workloads. For instance, I have observed TE pass along useful information to co-workers and offer assistance, without being asked.

TE really seems to be respectful toward employees and the workplace. I have noticed TE take personal interest in other employees and listen to their problems and worries. Furthermore, I have never seen TE be disrespectful of the workplace property or informal workplace rules and norms. Overall, TE has a great work attitude.

Inconsistent Peak Performance

Although TE is capable of tapping into unique potential and abilities that could produce impressive outcomes, TE's work is not especially exceptional. I believe it's because TE lacks some self-confidence and doesn't envision a successful outcome beforehand. TE is usually calm and mindful in challenging situations but does not always keenly focus on the task. TE shows a fair sense of determination and a positive attitude toward accomplishing work goals, but I'm not sure how dedicated TE is to achieving notably impressive outcomes.

TE may not be dedicated to the work and the culture of our industry, which seems to hinder TE from performing exceptionally well or to strive to be infallible, at least in certain situations. TE seems to have a fair bond with the work that makes them want to do well, but not necessarily to master the challenging aspects of the role. Nonetheless, TE certainly executes work tasks acceptably well. I think TE strives for a work style that is predictably well executed, overall.

Consistent Peak Performance

I should note that TE is capable of tapping into unique potential and abilities that have produced impressive outcomes. At times, TE's work was especially exceptional. I believe it's because TE is quite self-confident and expects a successful outcome. TE is calm and mindful in challenging situations and keenly focuses on the task. TE shows a strong sense of determination and a positive and dedicated attitude toward accomplishing work goals notably well.

TE seems dedicated to the work and the culture of our industry, which seems to motivate TE to perform exceptionally well and to strive to be infallible, at least in certain situations. TE seems to have a strong bond with the work that makes them want to master the challenging aspects of the role. TE certainly strategically executes the work behavior they've mastered, like an expert. I think TE strives for a work style that is predictably well executed, overall.

Final Four Reference Letters – Manipulated Content in Italics

Letter 1: Inconsistent Expected Performance and Inconsistent Peak Performance

Re: Reference Letter 1 for Target Employee (TE)

To whom it may concern,

I am pleased to provide the information about Target Employee (TE) that you requested. I refer to TE as TE, their, them, they, etc. to protect the employee's identity.

Overall, TE does fairly well at meeting the requirements of the job. TE generally performs the required tasks and duties in their job description, but does not always address issues that directly affect their performance evaluations. As for attendance, TE is normally not absent, but has given short notice for time off and has misused work and break time occasionally to tend to personal matters.

In general, TE is pleasant to have in the workplace and is considerate and friendly toward colleagues. However, TE isn't necessarily the type to be helpful toward new or absent employees or supportive toward colleagues with heavy workloads. For instance, I have never noticed TE offer assistance and pass along useful information to co-workers, without being asked.

TE generally seems to be respectful toward employees and the workplace. However, TE does not seem like the type to take personal interest in other employees or listen to their problems and worries. Nonetheless, I have never observed TE be disrespectful of the workplace property or informal workplace rules and norms. Overall, TE has a satisfactory work attitude.

Although TE is capable of tapping into unique potential and abilities that could produce impressive outcomes, TE's work is not especially exceptional. I believe it's because TE lacks some self-confidence and doesn't envision a successful outcome beforehand. TE is usually calm and mindful in challenging situations but does not always keenly focus on the task. TE shows a fair sense of determination and a positive attitude toward accomplishing work goals, but I'm not sure how dedicated TE is to achieving notably impressive outcomes.

TE may not be dedicated to the work and the culture of our industry, which seems to hinder TE from performing exceptionally well or to strive to be infallible, at least in certain situations. TE seems to have a fair bond with the work that makes them want to do well, but not necessarily to master the challenging aspects of the role. Nonetheless, TE certainly executes work tasks acceptably well. I think TE strives for a work style that is predictably well executed, overall.

Please contact me, if you require any additional information. Thank you for your assistance.

Sincerely,
HR Manager
Global Products and Services Ltd.

Letter 2: Inconsistent Expected Performance and Consistent Peak Performance

Re: Reference Letter 2 for Target Employee (TE)

To whom it may concern,

I am pleased to provide the information about Target Employee (TE) that you requested. I refer to TE as TE, their, them, they, etc. to protect the employee's identity.

Overall, TE does fairly well at meeting the requirements of the job. TE generally performs the required tasks and duties in their job description, but does not always address issues that directly affect their performance evaluations. As for attendance, TE is normally not absent, but has given short notice for time off and has misused work and break time occasionally to tend to personal matters.

In general, TE is pleasant to have in the workplace and is considerate and friendly toward colleagues. However, TE isn't necessarily the type to be helpful toward new or absent employees or supportive toward colleagues with heavy workloads. For instance, I have never noticed TE offer assistance and pass along useful information to co-workers, without being asked.

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I should note that TE is capable of tapping into unique potential and abilities that have produced impressive outcomes. At times, TE's work was especially exceptional. I believe it's because TE is quite self-confident and expects a successful outcome. TE is calm and mindful in challenging situations and keenly focuses on the task. TE shows a strong sense of determination and a positive and dedicated attitude toward accomplishing work goals notably well.

TE seems dedicated to the work and the culture of our industry, which seems to motivate TE to perform exceptionally well and to strive to be infallible, at least in certain situations. TE seems to have a strong bond with the work that makes them want to master the challenging aspects of the role. TE certainly strategically executes the work behavior they've mastered, like an expert. I think TE strives for a work style that is predictably well executed, overall.

Please contact me, if you require any additional information. Thank you for your assistance.

Sincerely,
HR Manager
Global Products and Services Ltd.

Letter 3: Consistent Expected Performance and Inconsistent Peak Performance

Re: Reference Letter 3 for Target Employee (TE)

To whom it may concern,

I am pleased to provide the information about Target Employee (TE) that you requested. I refer to TE as TE, their, them, they, etc. to protect the employee's identity.

Overall, TE does well at meeting the requirements of the job. TE is careful to perform the required tasks and duties in their job description, and is sure to address issues that directly affect their performance evaluations. As for attendance, TE is almost never absent and is considerate about giving ample notice for time off. TE uses work time appropriately and refrains from misusing break time or work time to tend to personal matters.

In general, TE is pleasant to have in the workplace and is quite considerate and friendly toward colleagues. TE is the type to be helpful toward new or absent employees and supportive toward colleagues with heavy workloads. For instance, I have observed TE pass along useful information to co-workers and offer assistance, without being asked.

TE really seems to be respectful toward employees and the workplace. I have noticed TE take personal interest in other employees and listen to their problems and worries. Furthermore, I have never seen TE be disrespectful of the workplace property or informal workplace rules and norms. Overall, TE has a great work attitude.

Although TE is capable of tapping into unique potential and abilities that could produce impressive outcomes, TE's work is not especially exceptional. I believe it's because TE lacks some self-confidence and doesn't envision a successful outcome beforehand. TE is usually calm and mindful in challenging situations but does not always keenly focus on the task. TE shows a fair sense of determination and a positive attitude toward accomplishing work goals, but I'm not sure how dedicated TE is to achieving notably impressive outcomes.

TE may not be dedicated to the work and the culture of our industry, which seems to hinder TE from performing exceptionally well or to strive to be infallible, at least in certain situations. TE seems to have a fair bond with the work that makes them want to do well, but not necessarily to master the challenging aspects of the role. Nonetheless, TE certainly executes work tasks acceptably well. I think TE strives for a work style that is predictably well executed, overall.

Please contact me, if you require any additional information. Thank you for your assistance.

Sincerely,
HR Manager
Global Products and Services Ltd.

Letter 4: Consistent Expected Performance and Consistent Peak Performance

Re: Reference Letter 4 for Target Employee (TE)

To whom it may concern,

I am pleased to provide the information about Target Employee (TE) that you requested. I refer to TE as TE, their, them, they, etc. to protect the employee's identity.

Overall, TE does well at meeting the requirements of the job. TE is careful to perform the required tasks and duties in their job description, and is sure to address issues that directly affect their performance evaluations. As for attendance, TE is almost never absent and is considerate about giving ample notice for time off. TE uses work time appropriately and refrains from misusing break time or work time to tend to personal matters.

In general, TE is pleasant to have in the workplace and is quite considerate and friendly toward colleagues. TE is the type to be helpful toward new or absent employees and supportive toward colleagues with heavy workloads. For instance, I have observed TE pass along useful information to co-workers and offer assistance, without being asked.

TE really seems to be respectful toward employees and the workplace. I have noticed TE take personal interest in other employees and listen to their problems and worries. Furthermore, I have never seen TE be disrespectful of the workplace property or informal workplace rules and norms. Overall, TE has a great work attitude.

I should note that TE is capable of tapping into unique potential and abilities that have produced impressive outcomes. At times, TE's work was especially exceptional. I believe it's because TE is quite self-confident and expects a successful outcome. TE is calm and mindful in challenging situations and keenly focuses on the task. TE shows a strong sense of determination and a positive and dedicated attitude toward accomplishing work goals notably well.

TE seems dedicated to the work and the culture of our industry, which seems to motivate TE to perform exceptionally well and to strive to be infallible, at least in certain situations. TE seems to have a strong bond with the work that makes them want to master the challenging aspects of the role. TE certainly strategically executes the work behavior they've mastered, like an expert. I think TE strives for a work style that is predictably well executed, overall.

Please contact me, if you require any additional information. Thank you for your assistance.

Sincerely,
HR Manager
Global Products and Services Ltd.

Appendix D – Online Survey Package for Study 3

Online Welcome Screen

STUDY TITLE: Outcomes of Expected/Standard and Peak Performance

WELCOME TO THE STUDY.

Please click the NEXT>> button below to read the Informed Consent Form for the Study. Please read the form carefully. If you agree to participate in the study, please click the NEXT>> button at the bottom of the form. If you do not agree to participate, or if you begin to participate and then decide to discontinue participation, you may exit the study, at any time, by closing your internet browser.

PLEASE CLICK NEXT>> TO READ THE INFORMED CONSENT FORM.

Study Informed Consent Form
(Saint Mary's University Research Ethics Board #20-024)

Study Title: Outcomes of Expected/Standard and Peak Performance
Tammy Mahar, Student Investigator (E-mail: Tammy.Mahar@smu.ca)
Dr. E. Kevin Kelloway, Advisor (E-mail: Kevin.Kelloway@smu.ca)

Saint Mary's University, Psychology Department
923 Robie Street, Halifax, Nova Scotia, B3H 3C3
Phone: 902.420.2846
Fax: 902.496.8287

This research study is being conducted by Tammy Mahar, a Ph.D. candidate in the Psychology Department at Saint Mary's University (SMU). The study is part of the Ph.D. program requirements and has been reviewed and approved by the SMU Research Ethics Board (REB #20-024). If you have any questions or concerns about ethical matters, please contact the REB at ethics@smu.ca or 902.420.5728. Otherwise, you may contact Tammy at tammy.mahar@smu.ca or Dr. E. Kevin Kelloway at Kevin.Kelloway@smu.ca.

You are being invited to participate in a research study about the effects of various performance styles on important organizational decisions. Results of this study will help to improve decision-making effectiveness in workplace settings. Participation involves taking on the role of a hiring manager. Your task is to review a reference letter for a job applicant and then provide ratings of their performance and worthiness of receiving acknowledgement, reward, and promotion. The study requires 15-20 minutes of completion time. You may skip any questions that you do not wish to answer or discontinue at any time and without penalty by closing your internet browser.

If you withdraw from the study prematurely by closing your internet browser, you will receive no compensation and your data will not be included in the study. If you reach the final screen of the survey, in order for your data to be included and for you to be compensated, you must complete at least 75% of the survey items in at least half the minimum expected completion time (i.e., at least 7.5 minutes). You are encouraged to answer all of the questions. However, if you choose to not answer specific questions, you will still receive compensation, as long as you answer at least 75% of the questions in at least 7.5 minutes and reach the end of the survey. Once you reach the final screen and submit your survey responses, it no longer will be possible to withdraw from the study.

The study involves no foreseeable risks. Participation is completely voluntary and anonymous, because no personally identifying information needs to be provided. Furthermore, only the student investigator will be analyzing the collected data, and results will be presented in a group format, thereby assuring your anonymity and confidentiality. Data collected via this online platform, Amazon Mechanical Turk, are stored on a secure server and not shared with third parties.

Once the study is complete, electronic data retrieved by the student investigator for analysis will be stored securely on password-protected hard drives. Only the student principal investigator and their advisor will have access to the data, and the data will contain no identifying information. Results of the study will be available by May 1, 2021. A summary of the study results will be available on SMU's Faculty of Graduate Studies and Research website: https://smu.ca/academics/summaries-of-completed-research.html.

By continuing onto the study, you are indicating that you understand what this study is about, appreciate the risks and benefits, consent to taking part in this research study, and do not waive any rights to legal recourse in the event of research-related harm. Furthermore, you are indicating that you have had adequate time to think about the research study, have had the opportunity to ask questions, and understand that participation is voluntary and can be discontinued at any time without penalty.

If you wish to participate in the study, please save or print a copy of this form for your records. Then, click the NEXT button below to begin the study. **By clicking the NEXT>> button to begin the study, you are agreeing to participate in the study.** If you do not wish to participate, please close your internet browser to discontinue.

Section 1: Demographic Questions

Please answer the following questions about yourself:

1. What is your gender? ___ Male, ___ Female, ___ Other
2. What is your year of birth? ___
3. How much work experience do you have? ___Years ___Months

Section 2: Reference Letter

Please imagine that you are a hiring manager who is reviewing a reference letter for a job applicant, referred to as Target Employee (TE). Please read the letter about TE and then complete the following survey by providing ratings of TE.

Participants were randomly assigned one of the following four letters (Appendix C):

Letter 1: Average expected performance and average peak performance
Letter 2: Average expected performance and high peak performance
Letter 3: High expected performance and average peak performance
Letter 4: High expected performance and high peak performance

Section 3: Survey Questions (35 Items)

Please complete the following survey, based on the reference letter you just read about TE.

Expected Performance (EP; Williams & Anderson, 1991)
Peak Performance (PP; Mahar, 2018)
Acknowledgement Items (A)
Rewardability Items (R)
Promotability Items (P)

Items were to be rated on a five-point
Likert scale:

1 = Strongly disagree
2 = Somewhat disagree
3 = Neither agree nor disagree
4 = Somewhat agree
5= Strongly agree

Based on the letter I just read, TE is the type of employee who…

EP1. Adequately completes assigned duties.
EP 2. Fulfills responsibilities specified in job description.
EP 3. Performs tasks that are expected of him/her.
EP 4. Meets formal performance requirements of the job.
EP 5. Engages in activities that will directly affect his/her performance evaluation.
EP 6. Neglects aspects of the job he/she is obligated to perform. (R)
EP 7. Fails to perform essential duties. (R)
EP 8. Helps others who have been absent.

EP 9. Helps others who have heavy workloads.
EP 10. Assists supervisor with his/her work (when not asked). (Original)
Assists his/her own supervisor with their work (when not asked). (Modified)
EP 11. Takes time to listen to co-workers' problems and worries.
EP 12. Goes out of way to help new employees.
EP 13. Takes a personal interest in other employees.
EP 14. Passes along information to co-workers.
EP 15. Attendance at work is above the norm. (Original)
Has attendance at work that is above the norm. (Modified)
EP 16. Gives advance notice when unable to come to work.
EP 17. Takes undeserved work breaks. (R)
EP 18. Great deal of time spent with personal phone conversations. (R; Original)
Spends a great deal of time with personal phone conversations. (R; Modified)
EP 19. Complains about insignificant things at work. (R)
EP 20. Conserves and protects organizational property.
EP 21. Adheres to informal rules devised to maintain order.
PP 22. Has demonstrated superior use of human potential during a work situation.
PP 23. Has demonstrated an incidence of superior functioning during a work situation.
PP 24. Acts energized and yet relaxed at work.
PP 25. Gets keenly focused on the task at hand.
PP 26. Acts highly determined at work.

Based on the letter I just read, I believe TE should…
A1. be praised for their qualities as an employee.
A2. be recognized for their qualities as an employee.
R1. receive a reward for their qualities as an employee (e.g., paid day off).
R2. receive a performance bonus of 10% of their salary for their qualities as an employee.
R3. receive a performance bonus of 20% of their salary for their qualities as an employee.
R4. receive a performance bonus of 30% of their salary for their qualities as an employee.
P1. be considered for a promotion.
P2. be recommended for promotion in the next year.
P3. be recommended for promotion in the next five years.

Feedback Form

THANKS FOR PARTICIPATING!

Feedback about the Study…

This study is being conducted to determine the effects of performance styles on important workplace decisions. A better understanding of the nature of performance leads to improved selection, training, reward, and promotion practices in workplace settings.

Results of the study will be available by May 1, 2021. A summary of the study results will be available on Saint Mary's University's Faculty of Graduate Studies and Research website: https://smu.ca/academics/summaries-of-completed-research.html.

If you have any questions or concerns about ethical matters, you may contact the Research Ethics Board at ethics@smu.ca. Otherwise, you may contact Tammy Mahar at tammy.mahar@smu.ca or Dr. E. Kevin Kelloway at Kevin.Kelloway@smu.ca. Please refer to REB file #20-024.

Please print or save a screen shot of this page for your records, in case you wish to contact the researchers at a later time.

Please click the NEXT>> button to submit your survey responses.