

# Skill Obsolescence in the Digital Age: Grit, Strength Based-Leadership Approach, and Employee's Career Adaptability in Multinational Corporations

Ali Aljofan<sup>1\*</sup>, Russel Faleh<sup>2</sup>, Fawaz Alrofiai<sup>3</sup>

<sup>1</sup>School of Management, Universiti Sains Malaysia, Penang, Malaysia.

<sup>2</sup>School of Psychology and Public Health, La Trobe University, Melbourne, Australia.

<sup>3</sup>College of Business and Law, RMIT University, Melbourne, Australia.

Email: \*aljofan@hotmail.com

**How to cite this paper:** Aljofan, A., Faleh, R., & Alrofiai, F. (2024). Skill Obsolescence in the Digital Age: Grit, Strength Based-Leadership Approach, and Employee's Career Adaptability in Multinational Corporations. *Open Journal of Business and Management*, 12, 3395-3416.

<https://doi.org/10.4236/ojbm.2024.125170>

**Received:** July 18, 2024

**Accepted:** September 15, 2024

**Published:** September 18, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

This exploratory study investigates skill obsolescence in the digital age, emphasizing the roles of grit and Strength-Based Leadership (SBL) in enhancing career adaptability within Multinational Corporations. Utilizing a cross-sectional design, data were collected from 113 employees across Australia, New Zealand, and Malaysia. Hypotheses were tested using regression analyses with bootstrapping techniques. The findings reveal significant relationships between grit, SBL, and career adaptability in the context of skill obsolescence. Grit, characterized by perseverance, is strongly associated with career adaptability, underscoring its role in helping employees navigate evolving skill requirements. SBL effectively bridges consistency of interest with career adaptability, even in the absence of a direct correlation. This study evaluates how combining grit and SBL enhances career adaptability, offering new insights into skill development strategies for transnational settings and practical recommendations for leaders to manage digital age complexities effectively.

## Keywords

Skill Obsolescence, Career Adaptability, Strength Based-Leadership, Grit, Multinational Corporations

## 1. Introduction

Skill obsolescence has become a critical issue for individuals, organizations, and economies in the rapidly developing digital age. The swift pace of technological

advancement and changing industry demands has led to widespread disruption, making skill obsolescence a central concern for firms (Del Giudice, Scuotto, Papa, Tarba, Bresciani, & Warkentin, 2021). Skill obsolescence refers to the decreasing relevance of existing skills due to technological progress, shifts in industry needs, and evolving job requirements (Kaufman, 1974). In an era where technology drives change, skills once deemed valuable can quickly become outdated, necessitating continuous updates to competencies. This challenge is exacerbated by internal factors such as employee age and limited skill application (De Grip & Van Loo, 2002).

According to Garcia-Macia, Hsieh and Klenow (2019), technological obsolescence within a firm can result from either the cannibalization of its own innovations or breakthroughs by industry competitors and external technological advancements. The rise of innovation and the expansion of high-tech industries can lead to labor substitution, challenging existing skill sets (Igami & Subrahmanyam, 2019; Walter & Lee, 2022). As technologies increasingly replace repetitive tasks, the impacts on employment become more pronounced. Despite its significant effects, technological obsolescence is often underexplored empirically due to the lack of directly observable measures (Ma, 2021).

Researchers such as Chifamba (2020) explored the impact of innovative technology on skill obsolescence among young individuals, highlighting how a significant skill mismatch can impede adaptability in the face of rapid technological change. In contrast, Dengler and Gundert (2021) examined the relationship between career adaptability and technological advancement in Germany, finding that employees who proactively update their skills are better equipped to handle new technologies. Additionally, Burgess (2023) addressed the issue of the soft skills gap and its impact on adaptability in the context of technology disruption. The study emphasized the role of a proactive personality in enhancing career adaptability, particularly in fields requiring high levels of interpersonal skills and adaptation to change.

To address the complexities of skill obsolescence, it is essential to explore not only the technical aspects of skill development but also the nuanced factors influencing an individual's ability to adapt and thrive amid constant change. This article examines skill obsolescence within Multinational Corporations (MNCs), focusing on the roles of grit—both Perseverance of Effort (PE) and Consistency of Interest (CI)—and the Strength-Based Leadership Approach (SBL) in enhancing employee career adaptability. In an era marked by rapid technological advancements and shifting paradigms, skills that were once essential are becoming obsolete at an accelerated pace. However, there is limited understanding of how organizations tackle obsolescence while undergoing digital transformation (Ates & Acur, 2022). Consequently, the dynamic digital landscape requires a workforce capable of rapidly acquiring new skills, discarding outdated ones, and adapting to evolving job requirements (Azevedo & Almeida, 2021). This poses a significant challenge to both employees and organizations, raising

concerns about career sustainability and the strategies needed to navigate this constantly evolving work environment.

Recently, Feliciano-Cestero, Ameen, Kotabe, Paul and Signoret (2023) highlighted that understanding technological obsolescence is crucial for firms undergoing digital transformation and internationalization, as it helps organizations remain competitive and relevant in the global market. In contrast, Daraojimba, Abioye, Bakare, Mhlongo, Onunka and Daraojimba (2023) reviewed a decade of approaches to understand the intricate relationships among technological development, creative applications, and entrepreneurial success. Their research focused on mitigating the effects of technological obsolescence through continuous innovation, adapting to emerging technologies, and fostering an adaptive organizational culture.

The rapid advancement of automation and artificial intelligence (AI) underscores the importance of addressing technological skill obsolescence in relation to career adaptability (Jaiswal, Joe Arun, & Varma, 2021). Tasks previously performed by humans are increasingly being automated, leading to the displacement of workers with outdated skills. For instance, routine manual tasks in manufacturing, data entry, and customer service are now being automated, pushing workers toward roles that demand greater creativity, problem-solving abilities, and technological proficiency. In response, our research investigates the potential impact of technological obsolescence on career adaptability in MNCs.

Emerging technologies continually reshape industries such as information technology, healthcare, and finance. Professionals in these sectors must continually update their skills to manage new software, tools, and methods. Those who resist change and fail to acquire new skills risk falling behind, which can limit their career options and lead to job losses. Additionally, globalization and the interconnectedness of MNCs play a significant role. As companies expand globally, they seek employees with diverse skill sets aligned with the latest technological trends (Jaiswal et al., 2021; Butler, 2016). Consequently, individuals who adapt to these changes and acquire the necessary skills become more attractive to employers, enhancing their career growth and stability.

At the core of our investigation is the concept of grit, a crucial trait that transcends traditional skill acquisition. In the face of skill obsolescence, the ability to persist in acquiring new knowledge and skills distinguishes those who merely survive from those who thrive. This article explores the psychological and behavioral dimensions of grit, particularly its role in fostering resilience and continuous learning among employees in MNCs. Additionally, the SBL approach proves vital in shaping organizational cultures that support skill adaptability. Leaders not only need to acknowledge the inevitability of skill obsolescence (De Meuse, Dai, & Hallenbeck, 2010) but also to cultivate environments that encourage active learning (Grabinger & Dunlap, 1995).

The objective of this study is to explore a leadership strategy that fosters a culture of innovation, collaboration, and continuous improvement, encouraging

employees to view change as an opportunity rather than a threat. As skill obsolescence becomes increasingly challenging in MNCs (Feliciano-Cestero et al., 2023), where diverse cultures, languages, and business practices intersect, our study examines how these unique dynamics heighten the need for adaptable skill sets. Additionally, it investigates the role of leadership in navigating the complexities of skill development.

From the perspective of career adaptability, the impact of skill obsolescence on transnational organizational behaviors is not well understood. This study goes beyond acknowledging change, focusing on proactive strategies to strengthen individuals and organizations against skill obsolescence. By highlighting the roles of grit and SBL, we aim to suggest ways to enhance career adaptability and resilience in response to evolving demands, which is crucial for the long-term success of MNCs in the twenty-first century. This research clarifies how these variables interact to influence skill obsolescence in workplace settings, contributing significantly to theoretical understanding. The study is organized as follows: the literature review, methodology, analysis, and a discussion of interpretations, implications, and recommendations for future research.

## 2. Literature Review

### 2.1. Career Adaptability

Career adaptability refers to an individual's ability to adapt and thrive in the face of evolving career circumstances. It is defined as the psychosocial constellation of individual resources that enable one to address current tasks, anticipate future work developments, and navigate career transitions (Savickas, 2007). Savickas and Porfeli (2012) suggest that career adaptability is a more enduring quality, representing a fundamental characteristic intrinsic to each individual. This trait is central to the career adaptability model, which depicts the attributes of a flexible and adaptable personality. Johnston (2018) further defined career adaptability as confidence in one's professional preparedness and the capability to acquire the necessary tools to manage career development tasks, changes, and personal challenges.

According to Abe, Abe and Adisa (2021), employment is directly impacted by skill obsolescence in the context of the Fourth Industrial Revolution (4IR). The digital sphere, marked by rapid innovations, underscores the need for swift adaptation. Therefore, we argue that technological skill obsolescence significantly influences career adaptability in the workforce of MNCs. In today's dynamic job market, individuals must embrace continuous learning, stay abreast of technological advancements, and proactively acquire new skills to remain competitive. The ability to adapt to evolving technologies not only ensures career relevance but also opens up new opportunities in a constantly changing career setting.

### 2.2. SBL

SBL is a leadership style that emphasizes identifying and leveraging individual

strengths to enhance team and organizational performance. The origins of SBL can be traced back to the positive psychology movement, which gained prominence in the late twentieth century, led by psychologists such as [Seligman and Csikszentmihalyi \(2000\)](#). According to [Faller \(2001\)](#), SBL has shifted the focus from pathology and dysfunction to the study of human strengths and optimal functioning. [Mackie \(2016\)](#) highlighted that, unlike traditional leadership models that often concentrate on weaknesses, SBL focuses on recognizing and utilizing individuals' unique capabilities and talents. The approach has gained increased recognition in organizational and business contexts, as noted by ([Bakker & Van Woerkom, 2018](#); [Moore, Bakker, & Van Mierlo, 2021](#)).

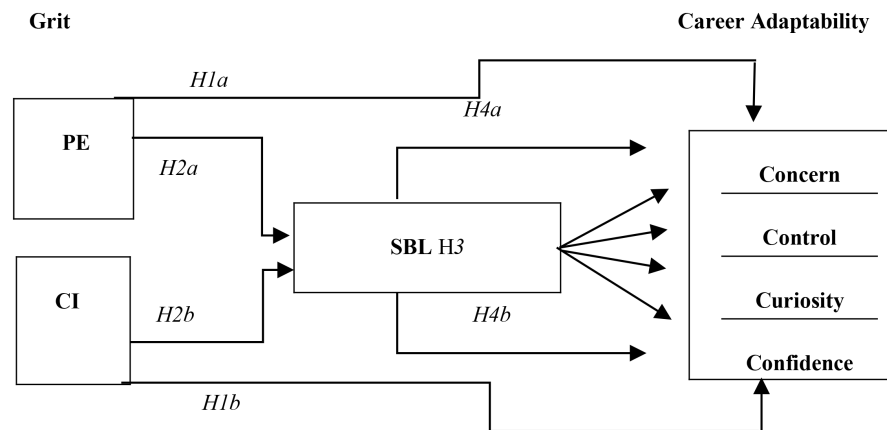
As SBL gained traction across various industries, leaders began to recognize the benefits of leveraging individual strengths within teams. Consequently, organizations started incorporating SBL principles into their leadership development programs to enhance employee engagement, job satisfaction, and overall productivity ([Ding, Liu, & Yu, 2023](#)). The SBL approach demonstrates that employees can effectively capitalize on their strengths at work when leaders assist in identifying and developing these strengths. [Liu and Tong \(2022\)](#) found that employees gain a better understanding of how to apply their strengths more effectively when SBL is implemented efficiently. Positive psychology and strengths-based thinking have thus become crucial for fostering a constructive and empowering leadership culture across professional settings. [Ding and Yu \(2021\)](#) showed that SBL positively correlates with the use of employee strengths, while [Chu, Ding, Zhang and Li \(2022\)](#) found that SBL is negatively related to turnover intentions.

### 2.3. Grit

Grit comprises two elements: PE and CI. PE, defined by [Duckworth, Peterson, Matthews and Kelly \(2007\)](#), involves continuous hard work and an unwavering commitment to achieving goals despite obstacles and setbacks. It is characterized by determination and the ability to persist in the face of adversity. CI refers to maintaining passion and dedication over time. Grit is a central concept in non-cognitive psychology and motivational theories, and it has been extensively researched ([Von Culin, Tsukayama, & Duckworth, 2014](#)). [Credé, Tynan and Harms \(2017\)](#) further supported the idea that success often depends not just on talent or intelligence but also on consistent effort and resilience.

Different psychological studies have shown that individuals who demonstrate PE are willing to invest long hours of effort and learn from their mistakes ([Duckworth & Gross, 2014](#)). This quality is crucial not only for personal endeavours but also for professional and academic pursuits. Individuals with high levels of PE are more likely to achieve their goals and experience greater satisfaction with their accomplishments ([Mason, 2018](#)). Conversely, research on CI often explores psychological and cognitive processes such as mindset, goal setting, and intrinsic motivation. [Datu \(2021\)](#) emphasized that understanding action-

oriented behaviors in various contexts can aid educators, psychologists, and other professionals in enhancing human performance. Both PE and CI are essential for personal and professional success, drawing significant interest from researchers across different fields. To illustrate the theoretical foundations of this research, **Figure 1** presents a framework linking grit, SBL, and career adaptability, thereby guiding the exploration of their interconnected roles.



**Figure 1.** Conceptual framework of the study.

### 3. Hypotheses Development

#### 3.1. Grit and Career Adaptability

Grit is a positive, non-cognitive attribute characterized by an individual's perseverance in the face of adversity and their sustained passion for a long-term goal (Duckworth et al., 2007). Morandini, Fraboni, De Angelis, Puzzo, Giusino and Pietrantonio (2023) highlight that in the face of skill obsolescence, employees often need to undergo retraining or upskilling. During this period of adjustment, grit becomes crucial, as learning new skills and adapting to changes can be challenging. Furthermore, technical difficulties might significantly impact employees in MNCs (Mcguinness, Pouliakas, & Redmond, 2023). Therefore, it can be argued that employees with high levels of grit are more likely to persist in learning new skills and maintaining their relevance within the organization. Based on these insights, we propose the following hypotheses.

**H1a:** *There is a positive relationship between employees' grit (PE) and Career Adaptability in MNCs.*

**H1b:** *There is a positive relationship between employees' grit (CI) and Career Adaptability in MNCs.*

#### 3.2. Grit and SBL

Embracing SBL represents a shift from a deficit-based managerial approach to one that focuses on leveraging individual strengths. By facilitating continuous learning and skill development, leaders can foster a culture that encourages employees to explore and utilize their strengths. This not only enhances employee

engagement but also helps in forming dynamic, adaptable teams that can thrive during challenging times (Liu & Tong, 2022; Sun, Xing, Wen, Wan, Ding, Cui, Xu, Wang, Xia, Zhang, & Yuan, 2023; Ding et al., 2023). We believe that combining SBL with grit can further enhance leaders' efforts in creating a supportive learning environment for employees, even amidst technical disruptions. Therefore, we propose the following hypotheses.

**H2a:** *There is a positive relationship between Grit (PE) and SBL in MNCs.*

**H2b:** *There is a positive relationship between Grit (CI) and SBL in MNCs.*

### 3.3. SBL and Career Adaptability

MNCs operate within diverse and complex environments, requiring adaptability from all organizational members. Research has consistently highlighted that SBL positively impacts employee engagement, psychological well-being, and task performance (Wang, van Woerkom, Breevaart, Bakker, & Xu, 2023; Ding & Yu, 2021). We anticipate that SBL not only enhances employee engagement but also contributes to the development of dynamic, adaptable teams capable of thriving amidst challenges in the increasingly globalized business environment. Consequently, we hypothesize that SBL will facilitate employees' ability to adapt effectively to changes in organizational structures, roles, and technologies.

**H3:** *There is a positive relationship between SBL and Career Adaptability in MNCs.*

### 3.4. SBL Mediation

A mediator is useful for describing how an independent variable influences a dependent variable (MacKinnon, 2011). Hence, this study proposed the following hypotheses for the mediating effect of SBL.

**H4a:** *SBL mediates a positive impact on the relationship between Grit (PE) and Career Adaptability in MNCs.*

**H4b:** *SBL mediates a positive impact on the relationship between Grit (CI) and Career Adaptability in MNCs.*

## 4. Methods

### 4.1. Sample and Procedure

Participants in the study were staff members from decentralized MNCs in Australia, Malaysia, and New Zealand, representing the food chain, electronics, automotive, and service industries. Of the 45 HR officers and managers contacted via email, phone calls, and professional networks, only eleven organizations agreed to participate. We collected data electronically using a Google Forms questionnaire, utilizing a convenience sampling technique to communicate with the participants.

A pilot study was conducted in January 2024 with twenty participants to as-

sess the validity and reliability of our questionnaire design. This pilot survey demonstrated a high level of content validity (van Teijlingen & Hundley, 2001). The finalized questionnaire was distributed in early February 2024 via direct emails to frontline and HR managers, who passed the forms along to their internal staff. Screening questions were included in the survey to ensure participants met the sample criteria. To minimize common method bias, a cover letter was attached, assuring respondents that their participation was both voluntary and anonymous (Podsakoff, MacKenzie, & Podsakoff, 2012).

We distributed 200 questionnaires to the research population and achieved a 56.5% response rate, which met the criteria for reliable data collection. This allowed us to evaluate the results with a reasonable degree of confidence, resulting in 113 valid responses with the following sectoral distribution: 48 in the food chain, 34 in automotive, 7 in electronics, and 24 in services. The respondents were predominantly male (74.3%), with 66.4% having a university undergraduate degree. The average organizational tenure stood at 22.6 years. Most respondents, 84.9%, were at the employee or staff level, with 45% being from Malaysia. The average age range was 26-30 years, with a standard deviation of 4.8. Therefore, in this study, a sample size of 113 was selected using Cochran's approach (Cochran, 1977). Based on calculations shown in Figure 2, this value ensures robustness and statistical significance with a 9.22% margin of error and a 95% confidence level.

$$n = \frac{113}{1 + \frac{113-1}{200}} = \frac{113}{1 + \frac{112}{200}} = \frac{113}{1 + 0.56} = \frac{113}{1.56} \approx 72.44$$

Figure 2. Source Authors. Microsoft Excel 2016 (v16.0).

Finite Population Correction (FPC) factor was used to adjust the limited population of 200, the sample size was adjusted to roughly 72.44. Thus, having 113 provides an even stronger sample. If the population is not indefinitely big, Cochran's formula can be adjusted using the FPC factor (Kasunic, 2005). The FPC factor is calculated using the formula shown in Figure 3 below.

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

Figure 3. Source (Cochran, 1977).

## 4.2. Measurements

### 4.2.1. SBL

This study measured SBL using the scale developed by Wang et al. (2023) to assess a leader's support for strengths use. An 8-item scale was utilized, formatted on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item from the scale is: 'My leader ensures that my job tasks are aligned

with my strengths.’ The study reported a Cronbach’s alpha of 0.97, indicating high reliability.

#### 4.2.2. Grit

To measure grit, we used an 8-item scale from Duckworth, Quinn and Seligman (2009), administered as a self-report tool. This scale includes two subscales: four items assessing PE, such as ‘I have overcome setbacks to conquer an important challenge,’ and four items assessing CI, such as ‘New ideas and new projects sometimes distract me from previous ones.’ Responses were recorded on a 5-point Likert scale (1 = not at all like me, 5 = very much like me). The scale achieved a Cronbach’s alpha of 0.77, demonstrating high internal consistency.

#### 4.4.3. Career Adaptability

This study utilized the Career Adapt-Abilities Scale (CAAS) by Savickas and Porfeli (2012), a 24-item scale designed to measure career adaptability across four dimensions: concern, control, curiosity, and confidence. Each dimension is assessed with six items on a 5-point Likert scale, ranging from 1 (‘not strong’) to 5 (‘strongest’). These dimensions are crucial psychosocial instruments for managing career transitions, work traumas, and developmental tasks. The adaptability score is determined by summing all 24 items. Reliability scores for the CAAS were 0.85 for confidence, 0.74 for control, 0.79 for curiosity, and 0.83 for concern, with an overall reliability score of 0.92 for the scale.

## 5. Analysis

In this investigation, Microsoft Excel 2016 (v16.0) was used for data handling, and SPSS Statistics version 24 facilitated statistical analyses. We employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using Smart-PLS 4 to test the proposed relationships, following a two-step approach to examine both measurement (outer) and structural (inner) models as suggested by Hair, Ringle and Sarstedt (2011). The PLS method was chosen due to the exploratory nature of the study Hair, Risher, Ringle and Sarstedt (2019). Initially, the measurement model was assessed to confirm the questionnaire’s validity and reliability, followed by hypothesis testing using the bootstrapping technique.

Normality and missing values in the data were assessed, with missing values being less than 5% of the total, thus no imputation was required. To evaluate Common Method Variance (CMV), Harman’s single-factor test was performed (Podsakoff et al., 2012), revealing that the first factor accounted for only 26% of the variance, indicating low CMV. A discriminant analysis was then conducted to verify the reliability of the data, leading to the creation of a comprehensive CB-SEM model for theory testing. The model’s goodness of fit was confirmed using maximum likelihood estimation and standard error calculations. Descriptive statistics are illustrated in Table 1.

**Table 1.** Descriptive statistics (N = 113).

Variable	Number of Observations (n)	Category	Frequency	Percent	Mode	Mean	SD	Min	Max
Age	113	18 - 25	40	35.4%	18 - 25	2.11	0.87	1	4
		26 - 30	45	38.8%					
		31 - 35	18	15.9%					
		36 and above	10	8.9%					
Gender	113	Female	29	25.7%	Male	1.74	0.44	1	2
		Male	84	74.3%					
Education	113	Diploma	15	13.3%	Undergrad	2.54	0.76	1	3
		Undergrad	75	66.4%					
		Postgrad	23	20.4%					
Country	113	Australia	20	17.7%	Malaysia	3.28	0.82	1	3
		New Zealand	42	37.2%					
		Malaysia	51	45.1%					
Organization tenure	113	Less than 1 year	5	4.4%	1 to 5 years	3.89	1.04	1	5
		1 to 5 years	20	17.7%					
		6 to 10 years	35	31.0%					
		11 to 15 years	18	15.9%					
		More than 15 years	35	31.0%					
Current Position	113	Employee	96	85%	Employee	1.22	0.53	1	3
		Manager	10	9%					
		Supervisor	7	6%					
Industry	113	Food Chain	48	42.5%	Food Chain	2.06	1.14	1	4
		Automotive	34	30.1%					
		Electronic	7	6.2%					
		Services	24	21.2%					

Table 1 summarizes the demographic information of the study's participants, including age, gender, education level, country of origin, organization tenure, current position and industry. It presents the number of observations, frequencies, percentages, mode, mean, standard deviation (SD), and minimum and maximum values for each variable. Source; SPSS Statistics version 24.

### 5.1. Model Measurement

The study utilized Structural Equation Modeling (SEM) and the PLS approach with Smart-PLS 4 for multivariate analysis. To evaluate the measurement model's validity and reliability, we assessed outer loadings, Composite Reliability (CR), Average Variance Extracted (AVE), and Heterotrait-Monotrait Ratio (HTMT). Results showed that all outer loadings exceeded the 0.6 threshold (Hair et al., 2011), with CR values above 0.7 and AVE values above 0.5, confirming

convergent validity.

Convergent validity assesses how well each item aligns with its corresponding construct (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). **Table 2** shows that all factor loadings are above the 0.70 threshold, indicating strong item-construct correlations. The Average Variance Extracted (AVE) values exceed 0.50, suggesting that the constructs account for a significant portion of the variance. Composite Reliability (CR) scores are also above 0.70, reflecting internal consistency. These results confirm the measurement model's convergent validity, ensuring that the constructs are accurately measured by their items.

**Table 2.** Convergent Validity Assessment

Variable	Items	Loadings	Cronbach's Alpha	CR	AVE
SBL	SBL1	0.819	0.918	0.934	0.802
	SBL2	0.801			
	SBL3	0.813			
	SBL4	0.790			
	SBL5	0.808			
	SBL6	0.798			
	SBL7	0.812			
	SBL8	0.779			
PE	GRIT1	0.809	0.922	0.936	0.810
	GRIT2	0.812			
	GRIT3	0.819			
	GRIT4	0.801			
CI	GRIT5	0.843	0.790	0.717	0.770
	GRIT6	0.788			
	GRIT7	0.670			
	GRIT8	0.780			
Conc	CA1	0.865	0.862	0.889	0.763
	CA2	0.869			
	CA3	0.725			
	CA4	0.703			
	CA5	0.724			
	CA6	0.693			
Ctrl	CA1	0.728	0.815	0.810	0.787
	CA2	0.768			
	CA3	0.808			

## Continued

	CA4	0.832			
	CA5	0.801			
	CA6	0.788			
Curio	CA1	0.749	0.836	0.756	0.812
	CA2	0.875			
	CA3	0.658			
	CA4	0.880			
	CA5	0.856			
	CA6	0.857			
Conf	CA1	0.813	0.882	0.816	0.799
	CA2	0.786			
	CA3	0.775			
	CA4	0.803			
	CA5	0.816			
	CA6	0.804			

**Table 2** presents the convergent validity results for the constructs under investigation. It includes the factor loadings, average variance extracted (AVE), and composite reliability (CR) values for each construct. \* Abbreviations: Conc (Confidence), PE (Perseverance of Effort), SBL (Strength Based-Leadership), Ctrl (Control), Curio (Curiosity), Conf (Confidence), CI (Consistency of Interest). Source; SPSS Statistics version 24.

This study employed the Heterotrait-Monotrait (HTMT) ratio to assess discriminant validity (Henseler, Ringle, & Sarstedt, 2015). HTMT ratios consistently below the stringent threshold of 0.85 (Cheung, Cooper-Thomas, Lau, & Wang, 2023) indicate acceptable discriminant validity. **Table 3** shows that the measurement model meets validity and reliability criteria, demonstrating that the construct effectively evaluate the structural model and related hypotheses.

**Table 3.** Heterotrait-Monotrait (HTMT).

Variable	Conc	PE	LBS	Ctrl	Curio	Conf	CI
Conc	0.843						
PE	0.226	0.824					
LBS	0.250	0.401	0.767				
Ctrl	0.312	0.236	0.232	0.828			
Curio	0.211	0.576	0.689	0.241	0.818		
Conf	0.196	0.140	0.425	0.364	0.392	0.811	
CI	-0.112	0.220	0.351	-0.065	-0.092	0.213	0.844

Note: Diagonal represents the square root of average variance extraction; off-diagonal represents the correlation. Source: SPSS Statistics version24.

## 5.2. Structural Model Evaluation

In examining the structural model,  $R^2$ , beta and the corresponding t-values are involved (Hair et al., 2014). To obtain the t-values, a bootstrapping process with 5000 resamples was applied. T-values are significant in accepting or rejecting a hypothesis. First, the study looked at grit and SBL as predictors of career adaptability. As shown in **Table 4** below, (PE -> CA) was positively related ( $\beta = 0.302$ ,  $t = 6.463$ ,  $p < 0.000$ ), and hence, H1a was supported. The following hypothesis of the study (CI -> CA) was not significantly related ( $\beta = -0.38$ ,  $t = 0.463$ ,  $p < 0.226$ ) and hence, hypothesis H1b was rejected. Hypothesis H2a (PE -> SBL) was significantly related ( $\beta = 0.201$ ,  $t = 6.441$ ,  $p < 0.000$ ), which is highly significant and hence, the hypothesis was supported. Hypothesis (CI -> SBL) was related showing ( $\beta = 0.113$ ,  $t = 6.421$ ,  $p < 0.000$ ), which is highly significant, and thus hypothesis H2b was confirmed. H3 (SBL -> CA) was highly significant ( $\beta = 0.314$ ,  $t = 5.122$ ,  $p < 0.000$ ) and the hypothesis was supported. **Table 4** presents a summary of the results of the hypothesis testing, including the pathways, standard errors, beta coefficients, t-values, p-values, and conclusions about the degree of support for each hypothesis at a 95% confidence level.

**Table 4.** Association of Grit (PE & CI) and SBL with career adaptability.

Hyp	Path	Beta	SD Error	T values	P Values	Decision	Significance 95%
H1a	PE -> CA	0.302	0.078	6.463	0.000	Supported	**
H1b	CI -> CA	-0.38	0.048	0.463	0.226	Not Supported	
H2a	PE -> SBL	0.201	0.060	6.441	0.000	Supported	**
H2b	CI -> SBL	0.113	0.057	6.421	0.000	Supported	**
H3	SBL -> CA	0.314	0.061	5.122	0.000	Supported	**

Note: \*\*P-value < 0.05; indicating high significance for all paths. Except for CI -> CA ( $p \geq 0.05$ ) ( $p = 0.226$ ) not significant. Source: SPSS Statistics version24.

**Table 5.** Mediating hypothesis result.

Hyp	Path	Beta	SD Error	T values	P Values	Decision	Significance 95%
H4a	PE -> SBL -> CA	0.66	0.022	3.08	0.000	Supported	**
H4b	CI -> SBL -> CA	0.58	0.017	2.78	0.000	Supported	**

Note: \*\*P-value < 0.05, results indicating high significance. Source; SPSS Statistics version 24.

The findings show that SBL is a significant mediator between (PE -> SBL -> CA), showing ( $\beta = 0.66$ ,  $t = 3.08$ ,  $p < 0.000$ ), demonstrating its high significance and supporting hypothesis H4a. Similarly, (CI -> SBL -> CA), showing ( $\beta = 0.58$ ,  $t = 2.78$ ,  $p < 0.000$ ) that was highly significant and hence, hypothesis H4a was supported. **Table 5** displays the results of the mediating hypotheses as well as the mediator's role in mediating the indirect effects. The table presents path coeffi-

cients, standard errors, t-values, and p-values for the direct, indirect, and total effects. A substantial indirect effect that confirms the existence of mediation at a 95% confidence level is indicated by a p-value of less than 0.05.

## 6. Discussion

While we have a foundational understanding of career adaptability, the influence of technology, particularly on employee skill obsolescence is less clear. This study addresses this gap by examining how grit impacts career adaptability within MNCs, with a focus on SBL principles. We proposed both a direct link between grit and career adaptability and an indirect relationship mediated by SBL. Our findings support the direct hypothesis (H1a), indicating that PE enables employees in MNCs to better adapt to job roles despite skill obsolescence. Existing literature suggests that training can enhance employees' PE as a self-regulatory process (Li, Yu, Mei, Liu, Li, & Luo, 2021). Our findings support this, indicating that persistence contributes to practical career adaptability. However, the direct relationship hypothesis (H1b) was negatively significant and thus rejected, showing that CI does not affect career adaptability in MNC employees facing skill obsolescence. This suggests that sustaining interest over time is less crucial for career adaptability.

The negative association observed might stem from the lack of distinct necessary skills (Vuchkovski, Zalaznik, Mitreĝa, & Pfajfar, 2023). Alternatively, individuals with fewer resources might be more inclined to persist in their interests compared to those who are wealthier, more educated, or have educated parents, who may be less dedicated and more likely to 'give it a try' (Kwon, 2021). Liu (2019) suggests that individuals may cling to their interests as a psychological resource when other options are limited. Consequently, this study indicates that maintaining interest may serve as an additional psychological resource for those lacking other critical resources. Supporting (Credé et al., 2017), who emphasized that PE is the primary component of grit, our findings confirm that while CI does not show predictive value, both H2a and H2b are supported, demonstrating a positive relationship between grit and SBL.

The construct links (the identification and development of grit as a strength), highlighting the synergy that emerges when individuals exhibit resilience while operating within their strengths. According to (Kannangara, Allen, Waugh, Nahar, Noor, Khan, Rogerson, & Carson, 2018), individuals with high levels of grit have a deeper understanding of their strengths, which they leverage to overcome challenges. Previous studies (Duckworth & Gross, 2014; Duckworth, 2016; Lee, Reasoner, Davidson, Pennings, & Lee, 2023) have demonstrated that higher grit levels correlate with a relentless pursuit of long-term goals, characterized by resilience and tenacity in adversity. In contrast, SBL focuses on identifying and developing individual strengths rather than addressing weaknesses (Bowers, 2008). This leadership style posits that individuals thrive when their natural strengths are identified, developed, and applied. Therefore, leaders adopting a

SBL approach should recognize grit as a crucial factor in enhancing adaptability.

Hypothesis H3 was supported, indicating that SBL has a positive relationship with career adaptability. SBL fosters an environment that enhances career adaptability, which is crucial as companies expand globally and seek employees with up-to-date technological skills (Jaiswal et al., 2021; Butler, 2016; Bakker, Hetland, Kjellevold Olsen, & Espevik, 2023). Employees who adapt to these changes and acquire relevant skills are more attractive to employers, facilitating career advancement and resilience. SBL emphasizes identifying and developing individual strengths rather than focusing on weaknesses.

Hypotheses H4a and H4b were supported, indicating that grit influences career adaptability through SBL. Previous research has explored how grit affects resilience, stress, burnout, and well-being (Al-Zain & Abdulsalam, 2022). Our findings reveal that grit also influences career adaptability via SBL. As SBL enhances employee adaptability within MNCs, it increases the potential benefits from training and upskilling. Consequently, our results support the notion that employee persistence improves retention, work engagement, and job performance (Southwick, Tsay, & Duckworth, 2019), thereby enhancing the use of personal resources and facilitating agile career adaptation.

Grit is measured using a tool that integrates psychological principles and natural abilities, enabling optimal performance and goal attainment within organizational contexts. The results indicate that this composition significantly impacts employees' proactive approach to skill development. Instead of merely reacting to skill obsolescence, leaders can foster a learning culture that encourages continuous improvement and skill acquisition. Employees who persist despite technological disruptions are more likely to exhibit higher career adaptability. This proactive stance aligns with the dynamic nature of the digital age, helping multinational organizations thrive amidst ongoing technological changes.

Positive psychology researchers have explored how strengths can be defined, measured, and utilized to benefit individuals and organizations, including improvements in performance, engagement, well-being, and stress reduction. This study underscores the importance of recognizing and understanding individuals' grit for SBL to be effective. Grit, characterized by a strong work ethic, resilience, and determination, can be identified as a strength. In a rapidly evolving job market, individuals who fail to adapt risk becoming obsolete as industries adopt new technologies. Given the swift pace of technological advancement, adaptability is crucial for career success. It is essential for organizations, employees, and society to collaboratively support skill development to mitigate the risk of obsolescence.

Our findings indicate that grit is the most effective approach, positively correlating with SBL and enhancing adaptability. This positive correlation may stem from the shared psychometric strengths underlying these constructs. Grit and career adaptability are complementary: grit offers the resilience needed to tackle immediate challenges of skill obsolescence, while career adaptability equips em-

employees with the foresight and flexibility required for long-term career transitions.

### 6.1. Theoretical Implications

Our study reveals that employees who receive support from their leaders in leveraging their strengths exhibit greater motivation and career adaptability. Previous research has shown that using strengths enhances career engagement (van Woerkom & Oerlemans, 2015). This study uniquely demonstrates how organizational behavior in combating skill obsolescence within MNCs is linked to the application of strengths. It significantly contributes to strengths theory by illustrating that SBL mediates the relationship between grit and career adaptability, thereby deepening our understanding of how grit enhances adaptability.

Employees who harness their grit are more likely to overcome failures and achieve long-term goals (Teimouri, Plonsky, & Tabandeh, 2020). Li et al. (2021) examined the impact of grit on career adaptability among Chinese college students using Self-Regulatory Processes (SRP). They found that grit enhances career adaptability through improved career exploration, decision self-efficacy, positive affect, and goal commitment. Similarly, Diaconu-Gherasim, ȚepordeiLabăr, Virgă and Măirean (2024) found that grit positively influences career adaptability, acting as a mediator between future time dimensions and adaptability.

Furthermore, SBL can be a crucial resource in supporting employees, as previous research has shown its effectiveness in increasing workplace engagement (Wang et al., 2023). In this study, the respondents, employees from MNCs, face ongoing technical changes and challenges in their work environments. Their success heavily relies on support from their organizations and leaders. Previous studies have also highlighted the positive correlation between employees' emotions and their work performance when leveraging strengths (e.g., Dubreuil, Ben Mansour, Forest, Courcy, & Fernet, 2021). Therefore, our results suggest that the combination of grit and SBL can significantly contribute to career success by enhancing career adaptability and performance.

Moreover, due to the non-experimental design of our study, we cannot establish causal relationships between grit, SBL, and career adaptability. Nonetheless, our research provides strong evidence supporting the positive impact of SBL. Although the relationship between grit, SBL, and career adaptability has not been extensively studied, our findings affirm their positive association and highlight their potential in enhancing employee career success.

### 6.2. Practical Implications

Organizations aiming to boost productivity should focus on leveraging employee strengths and fostering a culture of continuous learning. MNCs should create environments that support ongoing education by encouraging employees to engage in training sessions, online courses, and workshops. Previous research by De Clercq, Thongpapanl and Dimov (2011) highlights that the intra-organizational context affects the relationship between cross-functional collaboration and

productivity. Our study suggests that enabling employees to interact with various company functions enhances their adaptability. Employees with cross-functional training are better prepared to adjust to role changes due to their diverse skill sets.

Our results indicate that while organizations can support leaders and employees in leveraging their strengths, they must also implement agile workforce planning techniques, such as anticipating future skill needs and addressing gaps swiftly. This approach ensures employees continually adapt to the evolving demands of the digital age. Furthermore, fostering a positive feedback loop by encouraging and recognizing employees' dedication to skill development helps cultivate an adaptable, continuously improving organizational culture. Additionally, integrating grit assessments into the hiring process can help select candidates who are more likely to persevere and commit to their goals. Such assessments can also be valuable in professional development programs, guiding personalized training to enhance grit-related skills and improve career adaptability.

### 6.3. Limitations and Future Recommendations

Despite its careful design and development to meet its objectives, this study has limitations that future research could address. Firstly, the study focused on international contexts in Australia, New Zealand, and Malaysia. To enhance generalizability, future research should include larger samples from both developed and developing countries. While a small sample size is suitable for exploratory research and specific demographics, it limits the generalizability of the findings but provides valuable preliminary insights (Mthuli, Ruffin, & Singh, 2022).

Secondly, the cross-sectional design of this study limits the ability to infer causality between variables, as data were collected at a single point in time through survey questionnaires. To achieve a more comprehensive understanding of the causal relationships between grit, SBL, and career adaptability, longitudinal research is recommended. Such studies would track these variables over time and across various geographic contexts, including developing nations. According to White and Arzi (2005), longitudinal studies with extended data collection periods are more effective for examining changes in individuals' perceptions and behaviors. This approach could enhance our understanding of the most consistent predictors of career adaptability in global MNCs amidst technological disruptions.

Future studies should explore how remote work arrangements and technological disruptions impact career adaptability. Incorporating factors such as virtual training and development could provide valuable insights. Additionally, research could leverage the Leader-Member Exchange (LMX) theory, which examines the quality of interactions between leaders and subordinates (Kim, Phillips, Park, & Gully, 2023), to investigate how remote work practices and virtual training influence career adaptability

## 7. Conclusion

This study makes a significant contribution to the literature by highlighting the critical roles of grit and SBL in enhancing career adaptability within global organizations. By examining the relationship between grit and SBL, it underscores the importance of tailoring strategies to build resilient and adaptive teams capable of overcoming skill obsolescence challenges in MNCs. The findings provide new perspectives on leveraging employees' grit as a competitive advantage and address a gap in the literature by focusing on these traits. The study offers empirical insights that support the development of evidence-based strategies for managing skill obsolescence effectively and improving workplace adaptability.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- Abe, E. N., Abe, I. I., & Adisa, O. (2021). Future of Work: Skill Obsolescence, Acquisition of New Skills, and Upskilling in the 4. In E. N. Abe (Ed.), *Future of Work, Work-Family Satisfaction, and Employee Well-Being in the Fourth Industrial Revolution* (pp. 217-231). IGI Global. <https://doi.org/10.4018/978-1-7998-3347-5.ch015>
- Al-Zain, A. O., & Abdulsalam, S. (2022). Impact of Grit, Resilience, and Stress Levels on Burnout and Well-Being of Dental Students. *Journal of Dental Education*, *86*, 443-455. <https://doi.org/10.1002/jdd.12819>
- Ates, A., & Acur, N. (2022). Making Obsolescence Obsolete: Execution of Digital Transformation in a High-Tech Manufacturing SME. *Journal of Business Research*, *152*, 336-348. <https://doi.org/10.1016/j.jbusres.2022.07.052>
- Azevedo, A., & Almeida, A. (2021). Grasp the Challenge of Digital Transition in SMEs—A Training Course Geared towards Decision-makers. *Education Sciences*, *11*, Article 151. <https://doi.org/10.3390/educsci11040151>
- Bakker, A. B., & van Woerkom, M. (2018). Strengths Use in Organizations: A Positive Approach of Occupational Health. *Canadian Psychology/Psychologie canadienne*, *59*, 38-46. <https://doi.org/10.1037/cap0000120>
- Bakker, A. B., Hetland, J., Kjelleveold Olsen, O., & Espevik, R. (2023). Daily Transformational Leadership: A Source of Inspiration for Follower Performance? *European Management Journal*, *41*, 700-708. <https://doi.org/10.1016/j.emj.2022.04.004>
- Bowers, K. (2008). Making the Most of Human Strengths. In S. J. Lopez (Ed.), *Positive Psychology: Exploring the Best in People: Discovering Human Strengths* (pp. 23-36). Praeger.
- Burgess, H. (2023). *Developing and Leveraging Proactive Personality to Bridge the Soft Skills Gap*. Master's Thesis, Walden University. <https://scholarworks.waldenu.edu/dissertations/14984>
- Butler, D. (2016). A World Where Everyone Has a Robot: Why 2040 Could Blow Your Mind. *Nature*, *530*, 398-401. <https://doi.org/10.1038/530398a>
- Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2023). Reporting Reliability, Convergent and Discriminant Validity with Structural Equation Modeling: A

- Review and Best-Practice Recommendations. *Asia Pacific Journal of Management*, 41, 745-783. <https://doi.org/10.1007/s10490-023-09871-y>
- Chifamba, C. (2020). Career Flexibility: A Panacea to Skills Obsolescence. *Asian Journal of Education and Social Studies*, 7, 12-16. <https://doi.org/10.9734/ajess/2020/v7i430204>
- Chu, X., Ding, H., Zhang, L., & Li, Z. A. (2022). Strengths-Based Leadership and Turnover Intention: The Roles of Felt Obligation for Constructive Change and Job Control. *Frontiers in Psychology*, 13, Article 786551. <https://doi.org/10.3389/fpsyg.2022.786551>
- Cochran, W. G. (1977). *Sampling Techniques* (3rd ed.). John Wiley & Sons.
- Credé, M., Tynan, M. C., & Harms, P. D. (2017). Much Ado about Grit: A Meta-Analytic Synthesis of the Grit Literature. *Journal of Personality and Social Psychology*, 113, 492-511. <https://doi.org/10.1037/pspp0000102>
- Daraojimba, C., Abioye, K. M., Bakare, A. D., Mhlongo, N. Z., Onunka, O., & Daraojimba, D. O. (2023). Technology and Innovation to Growth of Entrepreneurship and Financial Boost: A Decade in Review (2013-2023). *International Journal of Management & Entrepreneurship Research*, 5, 769-792. <https://doi.org/10.51594/ijmer.v5i10.593>
- Datu, J. A. D. (2021). Beyond Passion and Perseverance: Review and Future Research Initiatives on the Science of Grit. *Frontiers in Psychology*, 11, Article 545526. <https://doi.org/10.3389/fpsyg.2020.545526>
- De Clercq, D., Thongpapanl, N., & Dimov, D. (2011). A Closer Look at Cross-functional Collaboration and Product Innovativeness: Contingency Effects of Structural and Relational Context. *Journal of Product Innovation Management*, 28, 680-697. <https://doi.org/10.1111/j.1540-5885.2011.00830.x>
- De Grip, A., & Loo, J. V. (2002). The Economics of Skills Obsolescence: A Review. In A. de Grip, J. van Loo, & K. Mayhew (Ed.), *The Economics of Skills Obsolescence (Research in Labor Economics, Vol. 21)* (pp. 1-26) Emerald Group Publishing Limited. [https://doi.org/10.1016/s0147-9121\(02\)21003-1](https://doi.org/10.1016/s0147-9121(02)21003-1)
- De Meuse, K. P., Dai, G., & Hallenbeck, G. S. (2010). Learning Agility: A Construct Whose Time Has Come. *Consulting Psychology Journal: Practice and Research*, 62, 119-130. <https://doi.org/10.1037/a0019988>
- Del Giudice, M., Scutto, V., Papa, A., Tarba, S. Y., Bresciani, S., & Warkentin, M. (2021). A Self-tuning Model for Smart Manufacturing SMEs: Effects on Digital Innovation. *Journal of Product Innovation Management*, 38, 68-89. <https://doi.org/10.1111/jpim.12560>
- Dengler, K., & Gundert, S. (2021). Digital Transformation and Subjective Job Insecurity in Germany. *European Sociological Review*, 37, 799-817. <https://doi.org/10.1093/esr/jcaa066>
- Diaconu-Gherasim, L. R., Țepordei, A., Labăr, A. V., Virgă, D., & Măirean, C. (2024). University Students' Future Time Perspective and Career Adaptability: The Mediating Role of Grit. *The Career Development Quarterly*, 72, 121-134. <https://doi.org/10.1002/cdq.12348>
- Ding, H., & Yu, E. (2021). Followers' Strengths-Based Leadership and Strengths Use of Followers: The Roles of Trait Emotional Intelligence and Role Overload. *Personality and Individual Differences*, 168, Article ID: 110300. <https://doi.org/10.1016/j.paid.2020.110300>
- Ding, H., Liu, J., & Yu, E. (2023). How and When Do Strengths Work? the Effect of Strengths-Based Leadership on Follower Career Satisfaction. *Personnel Review*, 53, 1392-1407. <https://doi.org/10.1108/pr-07-2022-0485>

- Dubreuil, P., Ben Mansour, J., Forest, J., Courcy, F., & Fernet, C. (2021). Strengths Use at Work: Positive and Negative Emotions as Key Processes Explaining Work Performance. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, *38*, 150-161. <https://doi.org/10.1002/cjas.1595>
- Duckworth, A. (2016). *Grit: The Power of Passion and Perseverance*. Scribner.
- Duckworth, A. L., & Gross, J. J. (2020). Behavior Change. *Organizational Behavior and Human Decision Processes*, *161*, 39-49. <https://doi.org/10.1016/j.obhdp.2020.09.002>
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and Passion for Long-Term Goals. *Journal of Personality and Social Psychology*, *92*, 1087-1101. <https://doi.org/10.1037/0022-3514.92.6.1087>
- Duckworth, A. L., Quinn, P. D., & Seligman, M. E. P. (2009). Positive Predictors of Teacher Effectiveness. *The Journal of Positive Psychology*, *4*, 540-547. <https://doi.org/10.1080/17439760903157232>
- Duckworth, A., & Gross, J. J. (2014). Self-Control and Grit. *Current Directions in Psychological Science*, *23*, 319-325. <https://doi.org/10.1177/0963721414541462>
- Faller, G. (2001). Positive Psychology: A Paradigm Shift. *Journal of Pastoral Counseling*, *36*, 7.
- Feliciano-Cestero, M. M., Ameen, N., Kotabe, M., Paul, J., & Signoret, M. (2023). Is Digital Transformation Threatened? a Systematic Literature Review of the Factors Influencing Firms' Digital Transformation and Internationalization. *Journal of Business Research*, *157*, Article ID: 113546. <https://doi.org/10.1016/j.jbusres.2022.113546>
- Garcia-Macia, D., Hsieh, C., & Klenow, P. J. (2019). How Destructive Is Innovation? *Econometrica*, *87*, 1507-1541. <https://doi.org/10.3982/ecta14930>
- Grabinger, R. S., & Dunlap, J. C. (1995). Rich Environments for Active Learning: A Definition. *ALT-J*, *3*, 5-34. <https://doi.org/10.1080/0968776950030202>
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, *19*, 139-152. <https://doi.org/10.2753/mtp1069-6679190202>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to Use and How to Report the Results of PLS-SEM. *European Business Review*, *31*, 2-24. <https://doi.org/10.1108/eb11-2018-0203>
- Hair, J. F., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool in Business Research. *European Business Review*, *26*, 106-121. <https://doi.org/10.1108/eb10-2013-0128>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling. *Journal of the Academy of Marketing Science*, *43*, 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Igami, M., & Subrahmanyam, J. (2019). Patent Statistics as an Innovation Indicator? Evidence from the Hard Disk Drive Industry. *The Japanese Economic Review*, *70*, 308-330. <https://doi.org/10.1111/jere.12234>
- Jaiswal, A., Arun, C. J., & Varma, A. (2021). Rebooting Employees: Upskilling for Artificial Intelligence in Multinational Corporations. *The International Journal of Human Resource Management*, *33*, 1179-1208. <https://doi.org/10.1080/09585192.2021.1891114>
- Johnston, C. S. (2018). A Systematic Review of the Career Adaptability Literature and Future Outlook. *Journal of Career Assessment*, *26*, 3-30.
- Kannangara, C. S., Allen, R. E., Waugh, G., Nahar, N., Khan, S. Z. N., Rogerson, S. et al.

- (2018). All That Glitters Is Not Grit: Three Studies of Grit in University Students. *Frontiers in Psychology, 9*, Article 1539. <https://doi.org/10.3389/fpsyg.2018.01539>
- Kasunic, M. (2005). *Designing an Effective Survey*. Software Engineering Institute.
- Kaufman, H. G. (1974). *Obsolescence & Professional Career Development*. AMACOM.
- Kim, M. S., Phillips, J. M., Park, W., & Gully, S. M. (2023). When Leader-Member Exchange Leads to Knowledge Sharing: The Roles of General Self-Efficacy, Team Leader Modeling, and LMX Differentiation. *The International Journal of Human Resource Management, 34*, 1442-1469. <https://doi.org/10.1080/09585192.2021.1886150>
- Kwon, H. W. (2021). What Can Sociology Say about Grit? a Cross-Cultural Exploration of the Relationships between Socioeconomic Status, Sense of Control, and Grit. *Socius: Sociological Research for a Dynamic World, 7*, 1-12. <https://doi.org/10.1177/23780231211005216>
- Lee, D., Reasoner, K., Davidson, C., Pennings, J. S., & Lee, D. H. (2023). The Relationships between Grit, Burnout, and Demographic Characteristics in Medical Students. *Psychological Reports, 126*, 2511-2529. <https://doi.org/10.1177/00332941221087899>
- Li, H., Yu, X., Mei, Y., Liu, X., Li, L., & Luo, N. (2021). The Effect of Grit on Career Adaptability of Chinese College Students Based on the Self-Regulatory Processes. *Frontiers in Psychology, 12*, Article 795153. <https://doi.org/10.3389/fpsyg.2021.795153>
- Liu, A. (2019). Can Non-Cognitive Skills Compensate for Background Disadvantage?—The Moderation of Non-Cognitive Skills on Family Socioeconomic Status and Achievement during Early Childhood and Early Adolescence. *Social Science Research, 83*, Article ID: 102306. <https://doi.org/10.1016/j.ssresearch.2019.04.019>
- Liu, Q., & Tong, Y. (2022). Employee Growth Mindset and Innovative Behavior: The Roles of Employee Strengths Use and Strengths-Based Leadership. *Frontiers in Psychology, 13*, Article 814154. <https://doi.org/10.3389/fpsyg.2022.814154>
- Ma, S. (2021). *Technological Obsolescence (No. w29504)*. National Bureau of Economic Research. <http://dx.doi.org/10.2139/ssrn.3964128>
- MacKie, D. (2016). Strength-based Leadership and Team Coaching in Asia Pacific. In A. Blackman, D. Kon, & D. Clutterbuck (Eds.), *Coaching and Mentoring in the Asia Pacific* (pp., 127-132). Routledge. <https://doi.org/10.4324/9781315630014-13>
- MacKinnon, D. P. (2011). Integrating Mediators and Moderators in Research Design. *Research on Social Work Practice, 21*, 675-681. <https://doi.org/10.1177/1049731511414148>
- Mason, H. D. (2018). Grit and Academic Performance among First-Year University Students: A Brief Report. *Journal of Psychology in Africa, 28*, 66-68. <https://doi.org/10.1080/14330237.2017.1409478>
- Mcguinness, S., Pouliakas, K., & Redmond, P. (2023). *Skills-Displacing Technological Change and Its Impact on Jobs: Challenging Technological Alarmism?* IZA—Institute of Labor Economics.
- Moore, H. L., Bakker, A. B., & van Mierlo, H. (2021). Using Strengths and Thriving at Work: The Role of Colleague Strengths Recognition and Organizational Context. *European Journal of Work and Organizational Psychology, 31*, 260-272. <https://doi.org/10.1080/1359432x.2021.1952990>
- Morandini, S., Fraboni, F., De Angelis, M., Puzzo, G., Giusino, D., & Pietrantoni, L. (2023). The Impact of Artificial Intelligence on Workers' Skills: Upskilling and Reskilling in Organisations. *Informing Science: The International Journal of an Emerging Transdiscipline, 26*, 39-68. <https://doi.org/10.28945/5078>

- Mthuli, S. A., Ruffin, F., & Singh, N. (2022). 'Define, Explain, Justify, Apply' (DEJA): An Analytic Tool for Guiding Qualitative Research Sample Size. *International Journal of Social Research Methodology*, 25, 809-821. <https://doi.org/10.1080/13645579.2021.1941646>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of Method Bias in Social Science Research and Recommendations on How to Control It. *Annual Review of Psychology*, 63, 539-569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Savickas, M. L. (2007). Internationalisation of Counseling Psychology: Constructing Cross-national Consensus and Collaboration. *Applied Psychology*, 56, 182-188. <https://doi.org/10.1111/j.1464-0597.2007.00284.x>
- Savickas, M. L., & Porfeli, E. J. (2012). Career Adapt-Abilities Scale: Construction, Reliability, and Measurement Equivalence across 13 Countries. *Journal of Vocational Behavior*, 80, 661-673. <https://doi.org/10.1016/j.jvb.2012.01.011>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive Psychology: An Introduction. *American Psychologist*, 55, 5-14. <https://doi.org/10.1037/0003-066x.55.1.5>
- Southwick, D. A., Tsay, C., & Duckworth, A. L. (2019). Grit at Work. *Research in Organizational Behavior*, 39, Article ID: 100126. <https://doi.org/10.1016/j.riob.2020.100126>
- Sun, C., Xing, Y., Wen, Y., Wan, X., Ding, Y., Cui, Y. et al. (2023). Association between Career Adaptability and Turnover Intention among Nursing Assistants: The Mediating Role of Psychological Capital. *BMC Nursing*, 22, Article No. 29. <https://doi.org/10.1186/s12912-023-01187-y>
- Teimouri, Y., Plonsky, L., & Tabandeh, F. (2020). L2 Grit: Passion and Perseverance for Second-Language Learning. *Language Teaching Research*, 26, 893-918. <https://doi.org/10.1177/1362168820921895>
- Van Teijlingen, E. R., Rennie, A., Hundley, V., & Graham, W. (2001). The Importance of Conducting and Reporting Pilot Studies: The Example of the Scottish Births Survey. *Journal of Advanced Nursing*, 34, 289-295. <https://doi.org/10.1046/j.1365-2648.2001.01757.x>
- Van Woerkom, M., Oerlemans, W., & Bakker, A. B. (2015). Strengths Use and Work Engagement: A Weekly Diary Study. *European Journal of Work and Organizational Psychology*, 25, 384-397. <https://doi.org/10.1080/1359432x.2015.1089862>
- Von Culin, K. R., Tsukayama, E., & Duckworth, A. L. (2014). Unpacking Grit: Motivational Correlates of Perseverance and Passion for Long-Term Goals. *The Journal of Positive Psychology*, 9, 306-312. <https://doi.org/10.1080/17439760.2014.898320>
- Vuchkovski, D., Zalaznik, M., Mitreĝa, M., & Pfajfar, G. (2023). A Look at the Future of Work: The Digital Transformation of Teams from Conventional to Virtual. *Journal of Business Research*, 163, Article ID: 113912. <https://doi.org/10.1016/j.jbusres.2023.113912>
- Walter, S., & Lee, J. (2022). How Susceptible Are Skills to Obsolescence? A Task-Based Perspective of Human Capital Depreciation. *Foresight and STI Governance*, 16, 32-41. <https://doi.org/10.17323/2500-2597.2022.2.32.41>
- Wang, J., van Woerkom, M., Breevaart, K., Bakker, A. B., & Xu, S. (2023). Strengths-based Leadership and Employee Work Engagement: A Multi-Source Study. *Journal of Vocational Behavior*, 142, Article ID: 103859. <https://doi.org/10.1016/j.jvb.2023.103859>
- White, R. T., & Arzi, H. J. (2005). Longitudinal Studies: Designs, Validity, Practicality, and Value. *Research in Science Education*, 35, 137-149. <https://doi.org/10.1007/s11165-004-3437-y>