EXAMINING THE PSYCHOMETRIC PROPERTIES OF THE

EXECUTIVE SKILLS QUESTIONNAIRE-REVISED IN THE

WORKING CONTEXT OF MALAYSIA

By

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ABSTRACT

**EXAMINING THE PSYCHOMETRIC PROPERTIES OF THE
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Hira Nasir

Executive functions (EFs) are a set of high-level cognitive and behavioural monitoring skills that involve sustaining attention on tasks, planning, organising, prioritizing, and self-monitoring. These skills are important to employees' work performance. Nevertheless, there are limited valid and reliable measures of EF in the organisational context. The 25-item Executive Skills Questionnaire-Revised (ESQ-R; Strait et al., 2019) measures five dimensions (e.g., plan management, time management, materials organisation, emotional regulation, and behavioural regulation) of EF. A lower score indicates better EF, or neurocognitive functioning such as planning and goal orientation. Nevertheless, the usability of this newly developed scale for employees remains unclear. The present study aims to evaluate the psychometric properties of the ESQ-R modified for working adults in Malaysia using a quantitative, Internet-based survey with a cross-sectional design. A total of 325 employees responded to the ESQ-R, Executive Function Index (EFI), self-rated creativity, and 9-item Utretch Work Engagement Scale (UWES-9). Several CFAs were conducted to compare three competing models (e.g., single-factor model, 5-factor model, and 5-factor second-order model) and determine the model of best fit. While all models showed good fit the 5-factor second-order model that is in line with the theoretical structure is preferable. The ESQ-R showed excellent internal consistency. Moreover, ESQ-R was negatively correlated with EFI, creativity,

and UWES-9 respectively, supporting the convergent, discriminant, and concurrent validity. The findings of the present study not only provide insights into the psychometric properties of the modified ESQ-R in the Malaysian context but also indicate that the ESQ-R is a useful tool for assessing working adults' EF. Practically, the results are of interest to organisations for evaluating and identifying employees' EFs and to researchers for developing intervention programmes helping employees with deficits in EFs.

Keywords: executive functioning, cognitive processes, confirmatory factor analysis, reliability, psychometric

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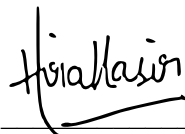
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It is hereby certified that Hira Nasir (ID No: 18AAM02423) has completed this dissertation entitled "Examining the Psychometric Properties of the Executive Skills Questionnaire-Revised in the Working Context of Malaysia" under the supervision of Dr Tan Chee Seng (Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science, and Mr Pheh Kai Shuen (Co-Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science.

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DECLARATION

I, Hira Nasir, hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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LIST OF ABBREVIATIONS

EF	Executive Functioning
EFs	Executive Functions
ESQ-R	Executive Skills Questionnaire-Revised
SRCS	Self-Rated Creativity Scale
UWES-9	9-item Utretch Work Engagement Scale
ESQ	Executive Skills Questionnaire
ADEXI	Adult Executive Functioning Inventory
EFI	Executive Function Index
BRIEF-A	Behaviour Rating Inventory of Executive Function-Adult Version
BDEFS	Barkley Deficits in Executive Functioning Scale
ADHD	Attention Deficit Hyperactivity Disorder
UKM	Universiti Kebangsaan Malaysia
EWB	Employee Well-being Scale
LWB	Life Well-being
WBW	Workplace Well-being
PWB	Psychological Well-being
CFA	Confirmatory Factor Analysis
DWLS	Diagonally Weighted Least Squares
ML	Maximum Likelihood
CFI	Comparative Fit Index
TLI	Tucker-Lewis Index
RMSEA	Root-mean-square-error of approximation
SRMR	Standardised root mean square residual

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Executive functions (EFs) denote intellectual behaviours that stem from the frontal lobes (e.g., reasoning, problem solving, planning, organising, self-monitoring, working memory; Ardila, 2018). In addition, a recent factor-analytic study suggested that EFs also involve an individuals' ability to manage and regulate time and emotions (Lace, McGrath & Merz, 2020). A considerable amount of literature have shown that EF is beneficial to salesperson' performance (Pluck et al., 2020), academic achievement (e.g., Nesbitt, Farran, & Fuhs, 2015; John, Dawson, & Estes, 2018), mental health (e.g., Martel, Nikolas, & Nigg, 2007), and sports performance (e.g., Sakamoto, Takeuchi, Ihara, Ligao, & Suzukawa, 2018).

The regulation of emotions and ability to effectively interact in complex environments are possible due to EFs (Carlock, 2011; Chan, Wang, & Ybarra, 2018). Individuals who are working in executive positions often work in uncertain and novel environments. It is essential for them to be able to switch between tasks and their different roles, make spontaneous decisions, have effective communication with their colleagues and be able to solve problems. As executive functioning (EF) has a pivotal part in the burgeoning of these abilities (Chan et al., 2018), it is reasonable to believe that EF may promote employees'

performance (Carlock, 2011). For example, employees' planning and time management skills, and emotional and behavioural regulation are facets of executive functioning that are essential to working performance and work engagement (Ahmad, Mohd. Yusuf, Mohamed Shobri, & Wahab, 2012; Castellano, Muñoz-Navarro, Toledo, Spontón, & Medrano, 2019; Harahsheh, 2019; Parke, Weinhardt, Brodsky, Tangirala, & DeVoe, 2018).

It was found by Parke et al. (2018) that the planning of managing ones' time improves employees' performance due to their being more engaged in the work. It was theorised that by allowing employees to take the initiative to set time-bound and realistic goals, and anticipating any interruptions they might face, work engagement would be improved (Parke et al., 2018). In essence, time management allows employees to determine which task to focus on and when, and also prioritise their tasks (Parke et al., 2018). Work performance can be improved through effectively adjusting attention, which allows employees to centre their attention to the task at hand and avoid untimely daydreaming (Chan et al., 2018; Schmeichel & Demaree, 2010). Interestingly, Castellano et al. (2019) found that employees experience less burnout and greater work engagement when they use elaborate methods to regulate emotions (for example, accepting harsh evaluations as a way to improve oneself). According to Chan et al. (2018) employees are expected to depend most on EFs when they lack time but are relied upon making effective decisions. When in a crux of time, or facing unconventional situations, executive functions enable direction of attention to the problem and out of the box thinking to come up with a solution.

1.2 Problem Statement

The study of executive functions within the organisational context has often been neglected, in spite of the critical role that EF plays in the performance of employees as well as the development of organisations. There are studies that argue that EFs are related to intelligence (Friedman et al., 2006; Ardila 2018) as well as evidence that the genetic influence on general intelligence highly overlaps with that of executive functioning (Engelhardt et al., 2016), thus potentially creating a misunderstanding that the two are interchangeable which might explain the gap within the organisational context (Chan et al., 2018). Hence, assessing EF within organisations might be deemed impractical (Chan et al., 2018). Regardless, the importance of assessing EF within the organisational context is arguable on the basis of the benefits it would reap should it be undertaken. As previous studies highlight, factors of EF are essential to work related constructs such as work engagement and work performance (e.g., Castellano et al., 2019; Harahsheh. 2019; Parke et al, 2018).

For the measurement of executive dysfunction amongst adults, or otherwise understood as deficits in executive skills, the development of the Executive Skills Questionnaire-Revised (ESQ-R) was spearheaded by Strait and colleagues (2019. It is hypothesised that the ESQ-R would serve as a probable measure of working adults' executive functions. Despite that, to date, the psychometric features of the measurement tool have not been studied in the organisational context. Hence, it is yet to be determined if the ESQ-R, within the working adults population, suffices as an appropriate measure of EF.

Firstly, the tool is to be studied in a context other than that for which it was initially intended therefore there is a need to determine if the items are applicable in this different context, this would highlight if the questions are interpreted by those responding to them as intended. A question that might seem to be worded correctly might illicit a wrong response due to incorrect interpretation or confusion (Greco & Walop, 1987). Next, the optimal factorial structure of ESQ-R is yet to be determined. A five-factor structure emerged in the development of the questionnaire; however, it was recommended to explore alternative factor structures in future studies (Strait et al., 2019), thus indicating that more research is needed to determine the suitable factor structure. In the book "Standards for Education and Psychometric Testing" (2014) it is noted that not all psychometric instruments are well developed, but those that are well-constructed are valid for their intended purpose and have appropriate internal consistency. Accordingly, examining the validity and reliability of ESQ-R would attest to the psychometric soundness of the scale. Accordingly, the aim of this research is to attend to this gap through investigation of the scales' psychometric qualities (e.g. reliability, validity, factor structure) in a selection of working adults' in Malaysia.

1.3 Significance of the Study

The research contributes to organisational psychology by first and foremost providing a validated EF measurement in the workplace context of Malaysia, where none previously exists. As EF is critical to employees' working

performance, identifying a valid and reliable EF measurement will allow recruiters to determine incoming employees' EF as well as use it for promotion purposes. Moreover, the scale may help organisations to identify areas of improvement within their employees' and grant them the tools to overcome them.

Another contribution of pursuing this research would be that organisations will have a useful EF assessment to gauge executive functioning of the applicants during employee selection procedures to identify the most suitable employees (Chan et al., 2018). This is especially beneficial for hiring higher level positions as the impacts of their decision making and performance are more crucial towards the betterment of the organisation, they require frequent or more sustained use of executive skills (Chan et al., 2018). Hence, if there exists a deficit in EF certain accommodation would need to be made.

Lastly, the (validated) ESQ-R can be used by the management to identify employees who struggle with executive deficits and refer them to the corresponding intervention programmes to improve their weaknesses. Indeed, several resources have been suggested for designing interventions (e.g., Dawson & Guare, 2012, 2018; Strait et al., 2019). Apart from those mentioned above, other intervention programmes such as aerobic exercises and resistance training (with an added component of cognition; Diamond & Ling, 2016; 2019) and attention training and attention state training (e.g., mindfulness practices and meditation; Tang & Posner, 2009) have also been found to enhance EFs.

1.4 Research Objective

The objective of the present study is to evaluate the psychometric qualities of the ESQ-R in a sample of executive employees working in Malaysia. Specifically, the study aims to;

1. To examine the factor structure.

2. To examine internal consistency.

3. a. To examine the convergent validity.

   b. To examine the discriminant validity.

   c. To examine the concurrent validity.

1.5 Research Question

1. What is the best factor structure of the ESQ-R in the Malaysian context?

2. Does the ESQ-R have considerable internal consistency?

3. a. Is there a negative correlation between ESQ-R and the Executive Function Index?

   b. Does the ESQ-R score have a significant correlation with the self-rated creativity score?

   c. Does ESQ-R score have a negative correlation with work engagement?

1.6 Hypothesis

H1:   ESQ-R score has a negative correlation with the Executive Function

Index.

H2:   ESQ-R score does not have a correlation with the self-rated creativity

score.

H3:   ESQ-R has a negative correlation with work engagement.

1.7 Definitions

1.7.1 Executive Functioning. Executive functioning is an umbrella term

for a group of higher-level cognitive functioning. It includes response inhibition,

emotional control, sustained attention, task initiation, flexibility and goal

directed persistence (Chan, Shum, Toulopoulou, & Chen, 2008; Dawson &

Guare, 2010). Executive functioning is operationally defined using the total

score on the Executive Skills Questionnaire-Revised (Strait et al., 2019). The

span of the total score is from 0 to 75. Individuals who have a higher score on

the instrument demonstrate greater executive dysfunction.

1.7.2 Self-Rated Creativity. Self-rated creativity is individuals'

perception of their ability to generate novel or useful solutions to problems, and

insights or idea generation (Amabile, 1983; Amabile 1988; Sternberg & Lubart,

1999). Self-rated creativity is operationally defined as the mean score obtained

from the Self-Rated Creativity Scale (SRCS; Tan & Ong, 2019), with the score

ranging from 1 to 5. A higher score indicating more creativity.

1.7.3 Work Engagement. Schaufeli and Bakker (2004) define work engagement as a state of mind that can be characterised by vigor (high levels of energy and mental resilience), dedication (strong involvement in one's work) and absorption (full concentration and engrossment in one's work). It is said to be the opposite of burnout as it shows a powerful identification with one's work and great levels of energy (Schaufeli & Bakker, 2004). Work engagement is operationally defined as the mean score obtained on the 9-item Utretch Work Engagement Scale (UWES-9; Schaufeli & Bakker, 2003), ranges from 0 to 6, with higher score indicating greater engagement in one's work.

CHAPTER 2

LITERATURE REVIEW

2.1 Executive Functioning

A person depends on executive functioning when there is a need to utilise higher level cognitive skills, and thus it is referred to a family of top-down mental processing (Diamond, 2013). It is often linked to the dorsolateral prefrontal cortex of the brain and is purported to be the centre of operation for the regulation of an individuals' cognition and action (Miyake & Friedman, 2012).

There is a general consensus that EF has three core components: inhibition, working memory, and cognitive flexibility (also referred to as shifting) (Diamond, 2013; Miyake et al., 2000). Inhibition involves the suppression of one's irrelevant behaviour, thoughts, emotions, and attention (Diamond, 2013). Hence, inhibitory control allows an individual to control how they react and behave. Working memory refers to the ability to store information within the mind and allows individuals to make use of conceptual knowledge to arrive at a decision or to create a plan (Diamond, 2013; Miyake et al., 2000). Lastly, cognitive flexibility or shifting is the ability to switch between perspectives, cope with changes flexibly, and make use of unexpected opportunities (Diamond, 2013).

EF has been found to be a core component of self-control or self-regulation (Miyake & Friedman, 2012), which are important to working performance (e.g., Porath & Bateman, 2006). Moreover, EF is related to other competencies which include an individuals' capabilities in making decisions, taking risks, gauging intentions of others, and the extent of trust between them and others (Carlock, 2011; Reynolds, Basso, Miller, Whiteside, & Combs, 2019; Weller, King, Figner, & Denburg, 2019). Apart from the mentioned, high levels of EF also result in greater resilience in an individual and promotes lower levels of physiological and subjective stress (Wu et al., 2021; Grimm, Agrigoroaei, Rohleder, & Becker, 2021). Taken together, it is reasonable to believe that employees with a high level of EF are likely to demonstrate good performance at their tasks.

2.2 Measurement of EF

As discussed by Strait et al. (2019) the available adult EF rating scales, although highly efficient and accessible, are expensive and are either technically inadequate or otherwise require extensive training for administration. Present measures of EF are mostly created and validated for individual's with neurodevelopmental or neurodegenerative disorders of the clinical population. Such measurement tools are unlikely to be used within the nonclinical population as they are, to a great extent, extremely pathological (Spinella, 2005). As such there exists the limitation of having few non-pathological measures of EF. Dawson and Guare (2010, 2012, 2018) established the Executive Skills

Questionnaire (ESQ) to comprehensively evaluate EF in various populations to overcome the limitation and to provide a well-structured and inexpensive self-assessment of EF. The ESQ consists of 33 items for children, teenagers, and students, while it consists of 36 items for adults. Regardless of the version, ESQ aims to evaluate 11 areas of executive skills such as working memory, planning, organisation, sustained attention, and flexibility.

Strait et al. (2019) recently revised the ESQ to cater to the young adult population and in relation to academic success. Moreover, the 25 items Executive Skills Questionnaire-Revised (ESQ-R) focuses on five dimensions, specifically; plan management, time management, material organisation, emotional regulation, and behavioural regulation. An added benefit of the various versions of the ESQ and the ESQ-R is that they come with an intervention guide which draw on the needs of the participant to help design suitable intervention plans accordingly.

In spite of the fact that the initial design of the ESQ-R catered to dimensions of EF that are applicable to academic contexts and tasks (e.g., material organisation), it is within reason to consider that the ESQ-R is also relevant for individuals within the working context. This is because relying on pre-existing knowledge alone is not sufficient when faced with new and unpredictable task demands, but rather employees need varying skill sets such as aptitude for planning and organising (ability to foresee obstacles that might arise within the organisation and having contingencies in place), regulation of emotion and behaviour (governing personnel along with co-workers, juggling

various roles, and handling unforeseeable and taxing circumstances), and time management (finding solutions or impromptu decision making) to achieve their goals (Chan et al., 2018).

The Adult Executive Functioning Inventory (ADEXI; Holst & Thorell, 2018) and the Executive Function Index (EFI; Spinella, 2005) are two other psychometric measurement tools of EF catered towards the nonclinical population. ADEXI is specially geared towards measuring working memory and inhibition, and is available as both a self-report and as a rating scale for a close friend or relative to complete (Holst & Thorell, 2018). Despite having satisfactory psychometric qualities, the scale on its own is not suitable for measuring EF in the working context. The authors (Holst & Thorell, 2018) report that multiple ratings are required for the scale, hence it cannot be used alone but rather is used with neuropsychological tools as an accompanying measure as opposed to a replacement.

The EFI, which consists of 27 items, is a self-rated measure of executive functioning and has considerably good internal consistency (.82; Spinella, 2005). Spinella (2005) reported five emerging factors of the EFI; motivational drive, strategic planning, organisation, impulse control, and empathy. Though validated across many settings, it was not inteded as an intervention focused measure, like the ESQ-R. It should also be highlighted that the ESQ-R has fewer number of items (25 items) than the EFI (27 items).

Apart from those mentioned above, several other measures of EF exist, however they are catered towards the clinical population. An example of such is the Behaviour Rating Inventory of Executive Function-Adult Version (BRIEF-A; Roth, Isquith, & Gioia, 2005), it consists of both a self-report and an informant report and comprises 75 items. BRIEF-A is employed for the diagnosis of clinical disorders (Roth, Isquith, & Gioia, 2005). Barkley Deficits in Executive Functioning Scale (BDEFS for Adults; Barkley, 2011) is another tool used to evaluate EF deficits, it consists of a short form and a long form option. BDEFS has an additional feature of an adult ADHD risk index in the long form (Barkley, 2011). While both BRIEF-A and BDEFS have great internal consistency and exhibit adequate psychometric properties, they are intended for the clinical population and are costly.

2.3 Executive Functioning and Work

Historically, the clinical context was the focus of most EF studies, particularly amongst individuals suffering from traumatic brain injury, dementia and other cognitive disorders (Douglas, 2010; Henry, Phillips, Crawford, Ietswaart, & Summers, 2006; Hollamby, Davelaar, & Cadar, 2017; Lai et al., 2016; Liss et al., 2001). Research on executive functioning is a burgeoning field hence publications on executive functioning within the general nonclinical population such as adults and working individuals is comparatively scant. In the context of work, executive functioning refers to the interplay linking intellect, perceptions, and reasoning for performing daily functions (Bade, 2010). EF skill areas (e.g., planning, sustained attention, cognitive flexibility) play an major role

in job success (Bailey, 2007; Cropley, Zijlstra, Querstret, & Beck, 2016). EFs enable creative problem solving that is crucial to job performance (Carlock, 2011).

Inhibitory control (one of the core EFs) allows us to alter and select our reactions and behaviour, an aspect of this is self-control (Diamond, 2013). Self-control hones discipline within the individual, without which it would be difficult to get any work done (Diamond, 2013). It enables them to stay on their task despite distractions and temptations to give up or move on to more interesting work (Diamond, 2013). Inhibition also plays an important role in social cognition, it allows behaviour and emotional regulation as it navigates social interactions (Carlock, 2011). Inhibitory control has also been associated with effective leadership (Ramchandran, Colbert, Brown, Denburg, & Tranel, 2016).

Working memory is another core EF, it is crucial when trying to make sense of things that unravel over time as it would require the individual to recall what happened earlier and make a connection to what comes later, reasoning would not be possible without this (Diamond, 2013). Future goals are linked with past learning and present action by means of working memory, which relates to planning and goal-oriented decision making (Carlock, 2011). According to the study by Diamond (2013) working memory supports inhibitory control; in order to know what is relevant and what to inhibit one must have the goal in mind, by concentrating on this the likelihood that the information will guide their behaviour increases. Likewise, inhibitory control also supports

working memory by helping us declutter our mental workspace by the suppression of extraneous thoughts and discarding information that is no longer relevant (Hasher & Zacks, 1988). This would enable the employee to focus attentively on the task at hand.

The third core EF is cognitive flexibility or otherwise known as shifting, it helps us think outside the box and change our perspectives, it also involves being flexible enough to accommodate changing demands and priorities and grasping opportunities (Diamond, 2013). It relates to the selection and implementation of strategies allowing an individual to complete a task or solve problems (Carlock, 2011). Carlock (2011) also notes that cognitive flexibility is also imperative for acceptable social interactions in the workplace as it allows the individual to shift their set of behaviours to what is appropriate within the workplace from that which is acceptable in the comfort of their home.

A skill area of EF involves planning which refers to the potential for accomplishing tasks by creating and adjusting plans (Dawson, 2014; Strait et al., 2019). At work, planning behaviours allows an individual to feel more productive in comparison to others and leads to more control and satisfaction (Claessens, Van Eerde, Rutte, & Roe, 2004). Claessens and colleagues (2004) describe planning behaviour as the decision making process of which task to perform and their prioritisation, as well as the ability to foresee and counter possible distractions. Planning is often operationalised as the setting and prioritisation of goals (Claessens et al., 2004).

Time management is another skill area of EF that covers the management (estimation and allocation) of time and the ability to switch tasks (Dawson, 2014; Strait et al., 2019). Time management was found to have moderating effects on job performance (Aeon, Faber, & Panaccio, 2021; Parke et al., 2018). This was because time management allows employees' to determine which task to focus on and when (Parke et al., 2018). It was also found that the better an employee is at managing their time the better their task performance is at higher citizenship levels (going above and beyond their formal job descriptions; Rapp, Bachrach, & Rapp, 2013). The ability to manage, maintain and utilise information and materials is the skill area of materials organisation (Dawson, 2014; Straits et al., 2019). Charity, Ngozi and Ngozi (2020) found that organisation skills impact job performance and it was purported that it brings about a positive organisational culture.

Emotional regulation is when an individual has the capacity to manage their emotions in order to complete tasks, reach their goals and manage their behaviour (Dawson, 2014). A study conducted by Chandra, Szwedo, Allen, Narr and Tan (2020) highlighted that higher emotional regulation skills in individuals with anxiety was able to predict greater career satisfaction in comparison to anxious individuals with lower emotional regulation. The study explained that a reason for this relationship would be that although the employee is physically anxious, their emotional regulation skills allows them to positively drive their behaviour by managing their response to their anxious feelings adaptively (Chandra et al., 2020). Another key benefit of high emotional regulation to employees is that they would be less exhausted by their work, this is because

they are better able to deal with the demands of their jobs (Zhao, Li, & Shields, 2019). One's ability to exhibit self-control and to think before they act (e.g. controlling impulses) is the component of behavioural regulation (Dawson 2014; Strait et al., 2019). Table 2.1 highlights the relevance of EFs in an organisational context.

Table 2.1

Executive functions and their relevance in an organisational context

Executive functions	Relevance to Organisation
Inhibitory Control	Carrying on working in a noisy or disruptive environment. The ability to change one's mind mid-course to take corrective measures.
Working Memory	The ability to include past knowledge when making decisions or completing similar tasks. Solving unfamiliar problems. Retaining information to use.
Cognitive Flexibility	Understanding different viewpoints. Adapting to changing demands.
Planning	The ability to anticipate events, set goals and develop strategies, allowing employees to complete a task before the deadline. Forward thinking.
Time Management	Keeping track of time. Being able to plan and arrive on time for work and meetings. Managing time in order to complete daily tasks.
Material Organisation	Keeping track of multiple things at a time. Keeping an organised workspace to avoid misplacement of important documents.
Emotional Regulation	Ability to maintain and regulate emotional control during positive and negative affective states.
Behavioural Regulation	To think before acting or speaking.

Note. Adapted from "Employer tips and resources 6", by Specialisterne, 2019 (https://specialisterne.com.au/employer-tips-and-resources-6/), and "Executive functioning issues in the workplace: What employers need to know" by S. Kappes, 2020 (https://www.understood.org/en/workplace/disability-inclusion-work/executive-functioning-issues-in-the-workplace-what-employers-need-to-know).

Jobs that come with responsibilities that regularly impose high levels of stress on one's attention while requiring effective performance are those in which executive functioning is highly valued (Chan et al., 2018). Chan and colleagues (2018) created a framework that proposed an individuals' success in their job performance is predicted by their EF, provided those jobs require immediate and responsive thinking as well as decision making capabilities in ambiguous situations.

Struggles in finishing tasks that call for mental control arise when there are deficits in executive functioning, this can lead to poor productivity and can also affect an individuals' chances at finding and keeping a job (Bailey, 2007; Cropley et al., 2016). Cropley et al. (2016) found that deficits in EF can occur due to work-related rumination as situational awareness is reduced at work. A worker's executive resources are depleted causing them to lose focus and have less flexibility in their thinking and cognition when they ruminate about work (Cropley et al., 2016).

Practitioners responsible for identifying and accommodating working individuals with cognitive limitations don't have readily available resources for performing evidence-based research to counter job jeopardy (Bade, 2010). It is proposed that organisations and researchers use assessments of EF for employee selection and promotion (Chan et al., 2018) as individuals with higher EF ability are more skilful when it comes to workplace tasks. Gauging employees' EF without error also assists in the recognition and retainment of talent within the organisation, for that reason the investigation and establishment of practical and

relevant EF measures within that context are highly encouraged (Chan et al., 2018).

2.4 Executive Functioning and Creativity

Creativity is a complex phenomenon and can be studied under various perspectives. It encompasses the inception of novel and practical ideas and inventions (Amabile, 1983; Sternberg & Lubart, 1999; Torance, 1965; Weiner, 2012). Studies have found that creativity is related to different elements of EF in the adult population (e.g., Krumm, Filippetti, & Gutierrez, 2018; Zabelina, Friedman, & Andrews-Hanna, 2019).

Empirical results from the study conducted by Gilhooly, Fioratou, Anthony, and Wynn (2007) suggest that EFs are involved in divergent production of novel responses. Participants who displayed greater executive functioning as indicated by their results in a cognitive flexibility task could compose a greater number of novel responses (Gilhooly et al., 2007). Zabelina and colleagues (2019) report that because artists can manage their thoughts and actions and in addition, shift between goals and ideas respectively, they are shown to have substantial overall EFs and cognitive flexibility. It was also found that those with more artistic tendencies and achievements had better inhibition abilities (Zabelina et al., 2019). Similarly, Benedek, Franz, Heene and Neubauer (2012) uncovered that various creativity instruments, including measures of divergent thinking, positively correlate with cognitive inhibition. It was found that by

disregarding irrelevant responses, cognitive inhibition allowed the production of novel and original ideas (Benedek et al., 2012).

Few studies investigate the relationship between working memory (a core area of EF) and creativity (e.g., Lee & Therriault, 2013; Sharma & Babu, 2017). Lee and Therriault (2013) found that working memory significantly predicts convergent thinking and associative fluency. Lee and Therriault (2013) also exhibited that the ability to overcome interfering unoriginal responses is more likely to be successful in university students with high working memory capacity. Working memory allows an individual more likely to generate more novel approaches and responses on creative and divergent thinking tasks (Lee & Therriault, 2013; Zabelina et al., 2019). In sum, it is demonstrated that executive functioning plays an important role in creativity.

2.5 Executive Functioning and Work Engagement

Schaufeli, Salanova, Gonzáles-Romá and Bakker (2002, p. 74) describe work engagement as a "positive, fulfilling, work-related state of mind." Parke et al. (2018) state that daily work performance was improved by the enhancing of engagement at work due to time management (a dimension of EF in ESQ-R). The study revealed that the positive effects of time management on work engagement were weaker in the presence of interruptions, hence depicting interruptions as a key moderator to the strength of the relationship between engagement and performance (Parke at al., 2018).

Interestingly, literature shows mixed results when studying emotional regulation and work engagement. Castellano et al. (2019) conducted a study and observed that when employees avail elaborate processes of emotional regulation, they are able to display greater engagement. On the contrary, Barreiro and Treglown (2020) conducted a study that suggests higher levels of work engagement in employees who were less able to regulate their emotions. This contradiction could be explained by the findings of Castellano et al. (2019) that working adults who used automatic processes of regulating emotions (such as rumination) experienced more negative affect. Greenier, Derakhshan and Fathi (2021), like Castellano et al. (2019), report that there is a significant positive association between emotional regulation and work engagement. In a sample of British and Iranian English language teachers, it was found that in the instance of positive emotional experiences, there was an increase in work engagement (Greenier et al., 2021). Additionally, a study conducted by Yousefi, Farmarzi, Malekpour and Yarmohammadian (2019) amongst students with dyslexia, revealed that school engagement of students improved when using EF--based interventions.

2.6 Employee Well-being as a Control Variable

Employee well-being is described as a three-dimensional concept that takes into consideration an employees' work and personal life (Zheng, Zhu, Zhao, and Zhang, 2015). It is the perceptions, feelings, and psychological experience of their levels of satisfaction towards work and life, hence it can be broken into three basic facets; life well-being (coined in lieu of the term

subjective well-being), work well-being and psychological well-being (Zheng et al., 2015).

The relationships between well-being, creativity, and work engagement highlight the necessity for controlling the effects of employee well-being. Firstly, research shows that well-being is positively related to creativity (e.g., Acar, Tadik, Myers, van der Sman, & Uysal, 2020; Dolan & Metcalfe, 2012; Miao & Cao, 2019). Additionally, there is substantial evidence that there exists a correlation between well-being and work engagement as well (e.g., Çankir & Şahin, 2018; Damianus, Magallanes, Foronda, & Encarnacion, 2020; Rasool, Wang, Tang, Saeed, & Iqbal, 2021; Sivapragasam & Raya, 2017). Consequently, employee well-being is used as a statistical control in the context of this study.

2.7 Use of Psychometric Assessments within Organisations in Malaysia

Psychometric tests were getting increasingly popular within Malaysia, and that large organisations like Petronas use written psychometric tests extensively as a part of their selection process to ensure the right person lands the right job (Lee, 2003). Petronas was said to have been using psychometric tests within the organisation for the past 10 years, which would mean they have been making use of the assessment tools since 1993. Similarly, psychometric tests have been used for promotions to managerial positions as disclosed by a human resource manager from a public company (Lee, 2003).

Rohaidi (2017) reports on the GovInsider digital platform that six government agencies have launched the use of psychometric testing as stated by the Science, Technology, and Innovation Minister of Malaysia. Endorsed and supported by the Malaysian Ministry of Education, Tell N Search is an organisation that has developed and integrated psychometric tests into a digital platform and provide it in two suites: Education, for higher learning institutions, and Enterprise suite for human resource departments (Karim, 2017). The Education suite is, for example, used by Universiti Kebangsaan Malaysia (UKM) to screen students and employees for promotion, hiring, talent development and performance appraisal while the Enterprise suite is used for hiring and promotion (Karim, 2017). Moreover, psychometric assessments have also been widely used by the Public Services Commission of Malaysia, in recruitment and selection of civil servants (Public Services Commission of Malaysia, 2021).

Considerable researches have been carried out on the development and/or validation of psychometric scales in the working context of Malaysia (e.g., Abu Bakar, Walters, & Halim, 2014; Ahmed, Abdul Majid, & Mohd Zin, 2016; Johari, Mit, & Yahya, 2009; Sulaiman & Zahoni, 2016; Thien, Razak, & Ramayah, 2014). The development of the Malaysian Workplace Bullying Index (Kwan, Tuckey, & Dollard, 2020) is one such scale and is indicative of the use and need of psychometric scales in the working context of Malaysia. Hence, it is reasonable to study the developmental properties of a scale of EF in the organisational context of Malaysia as literature suggests that companies employ psychometric tools within their organisations for various purposes.

2.8 Goal Setting Theory

While there is an array of definitions to elucidate EFs, there is a general understanding that they are a process or skill that individuals draw upon to accomplish a goal (Pavetti, 2014). Why some people are better than others at executing work tasks is a common question that can be answered by means of the goal setting theory (Latham & Locke, 1991). The theory posits that this difference between individuals is due to different performance goals (Latham & Locke, 1991). Difficult or high goals, in comparison to easy or vague goals, lead to higher levels of performance as long as the individual is committed to the goal and has the ability to accomplish it (Locke & Latham, 2006).

High goals lead to greater effort and persistence, they direct attention, effort, and action that work toward goal-relevant actions (Locke & Latham, 2006). Goals motivate individuals to use their existing abilities, this is because performance is a function of ability and motivation, and depends upon requisite task knowledge and skills (Locke & Latham, 2006). Locke and Latham (2006) explore the key moderators to goal setting which are; feedback, for keeping tabs on task progression; commitment to the goal; complexity of the task, how challenging the goal is; and lastly specificity of the goal.

According to Strait et al. (2019) plan management, emotional regulation and behaviour regulation include the independent executive skill of goal-oriented persistence or managing emotions to achieve goals (in the case of emotion regulation), thus the goal setting theory is appropriate to these EFs.

Philip Zelazo, a neuroscientist devised a framework for goal-attainment that is relevant to executive functioning skills (Pavetti, 2014). The author breaks the framework into four key subcomponents: representation (e.g., discovering the problem or task), planning (e.g., what the plan is), execution (e.g., how the plan would be carried out), and evaluation (e.g., feedback on the plan) (Pavetti, 2014). Representation, planning, and evaluation are related to cognitive flexibility, working memory is related to the planning stage, and inhibitory control is related to the execution of the plan (Pavetti, 2014).

Representation ties in with specificity from the goal setting theory. In order for a goal to be specific it must first be known what the problem or task is for which a goal must be set. The planning stage involves preparing how the task or goal would be achieved, plan and time management would allow this. A challenging task would require greater planning for which working memory would come into play, material organisation exhibits the independent executive skill of working memory (Strait et al., 2019). Emotional regulation is needed in order to manage one's emotions so that they can attain a goal, and complete a task (Strait et al. 2019; Dawson & Guare, 2009). Lastly, evaluation of how well the plan was carried out in order to achieve the goal would require feedback, and potential revisions to the plan. To be able to revise the plan and make adjustments, the individual would need to be accommodating to changing demands and draw on the past experience of executing the plan, this involves cognitive flexibility and working memory (Pavetti, 2014).

CHAPTER 3

METHODOLOGY

3.1 Research Design and Participants

A cross-sectional design with a quantitative approach was used for the study. Participants were recruited through online surveys using the homogenous purposive sampling method. The benchmark to include participants was that they are executive professionals working full-time and have a work experience of a minimum of a year and presently working in Malaysia, this is due to the fact that in Malaysia the length of the probation period generally varies between three and twelve months during which the organisation determines if the new employee is fit for the job (Lee, Zakariah, & Sabidi, 2021). As specified by the Public Services Commission of Malaysia (n.d.), executives (Management and Professional Group) are professionals working at Grade 41 and above. For instance; engineer, journalist, landscape architect are all considered executives. Appendix A shows the directory of executive professionals retrieved from the Malaysian Standard Classification of Occupations (Department of Statistics Malaysia, 2019).

Drawing on the Malaysia Statistical Handbook 2018, there were 2,484,900 managers and professionals. Using the sample size calculator of Qualtrics with a confidence interval of 95% and a margin error of 5%, the required sample size was 385. According to the study conducted by Boomsma

and Hoogland (2001), the minimum sample size would be 200. 458 responses were recorded overall. Nonetheless, owing to a participants' disagreement to participating in the study, not fulfilling the basis of participation (e.g., non-executive, part-timer, not currently working in Malaysia), or not responding in the questionnaire's at all, a sum of 133 responses were excluded. The 325 responses submitted for analysis consisted of 153 males and 171 females with 1 participant did not answer the question. Of the participants, 275 were Malaysians while 50 were foreigners. The details of the participants' demographic were reported in Chapter 4.

3.2 Instruments

3.2.1 Executive Skills Questionnaire-Revised (ESQ-R; Strait et al., 2019). The ESQ-R was developed as a self-report instrument to understand executive skills strengths and challenges. The scale measures executive deficiency across 25 items on a 4-point frequency-based response scale: Never or Rarely (0), Sometimes (1), Often (2), and Very Often (3). The instrument has five dimensions: plan management, time management, materials organisation, emotional regulation, and behavioural regulation. Plan management (11 items) indicates the potential an individual has to fulfil a task through the creation and management of plans. An example of the item is "*I have trouble with tasks where I have to come up with my own ideas*". Time management (4 items) refers to an individuals' capabilities in managing time through various means such as estimating it, allocating it, and operating in the confines of its limits or constraints. An example of the item is "*I have trouble estimating how long it will*

take to complete a task". Materials organisation (3 items) alludes to the individuals' ability to develop and put systems in place that allows them to keep up with information. Sample item is "*I lose things*". Emotional regulation (3 items) encompasses the ability of an individual to fulfil tasks, attain desired results and goals, and govern their behaviour, an example of the item is "*I get upset when things don't go as planned*". Finally, behaviour regulation (4 items) demonstrates the potential of an individual to exercise self-control and prior to responding, take the consequences their actions might have into consideration. A specimen of the item is "*I say things without thinking*". To precisely identify areas where there is a deficit in EF, the mean score of each of the five dimensions can be looked at whereas general dysfunction in EF can be gauged by observing the total score (sum of the 25 item scores). An individual demonstrates lower executive functioning when they score high on the questionnaire. The scale shows remarkable internal consistency (Cronbach's alpha = .91) (Strait et al., 2019).

The researchers examined the original items to determine statements which were worded in an unfamiliar manner to that which is common in the Malaysian context. A survey was created whereby alternative statements that would best replace the original were provided for the item statements that are uncommon in the Malaysian context and for those that could be further simplified or clarified. A pre-test study was then conducted using the survey to determine which of the alternative statements were preferable to the original, in order to better cater to the population of the present study. Slight modifications to the questionnaire were required. A total of 8 out of 25 items (items number 1,

4, 6, 19, 20, 22, 24, 25) were provided with alternative statements, an example would be "I act on the spot without planning" for which the original was "I act on impulse".

3.2.2 Executive Function Index (EFI; Spinella, 2005). In order to measure EF within the general healthy population, the EFI– a 27 item self-rated scale, was developed. The scale measures EF using five factors (empathy, organisation, impulse control, motivational drive, and strategic planning) across a 5-point Likert scale (*1 = Not at all, 5 = Very much*). Prior to summating the total of the 27 item scores, thirteen items of EFI are reverse scored. Greater EF is indicated through a higher score. The Cronbach's alpha for the scale was reported to be .82 (Spinella, 2005).

3.2.3 Self-Rated Creativity Scale (SRCS). The SRCS is a self-report measure of an individuals' creativity. It consists of 13 items (e.g., "*I am a good source of creative ideas*") scored on a 5-point Likert scale (*1 = Strongly Disagree, 5 = Strongly Agree*). An individual with a high mean score demonstrates better creativity (Tan & Ong, 2019). The Cronbach's alpha coefficient reported in Tan and Ong's (2019) study was .96.

3.2.4 9-item Utretch Work Engagement Scale (UWES-9). Schaufeli and Bakker (2003) developed the short version of the Utretch Work Engagement Scale (UWES; Schaufeli & Bakker, 2003) to assess employees' engagement in work. The scale has 9 items and is measured across a 7-point Likert scale (*0 = Never, 6 = Always/Everyday*). The items are explained by three dimensions:

vigour (e.g., "At my work, I feel bursting with energy"), dedication (e.g., "I am enthusiastic about my job"), and absorption (e.g., "I am immersed in my work"). Greater work engagement is indicate by a higher average score. The scale reported Cronbach's alpha (α) of .93 (Schaufeli & Bakker, 2004).

3.2.5 Employee Well-being Scale (EWB). The 18 item scale, developed by Zheng, Zhu, Zhao, and Zhang, 2015, is measured on a 7-point Likert scale (*1 = Strongly Disagree, 7 = Strongly Agree*). There are three subscales in EWB: life well-being (LWB; e.g., "My life is very fun"), workplace well-being (WBW; e.g., "Work is a meaningful experience for me"); and psychological well-being (PWB; e.g., "I handle daily affairs well"). Respondents who score high (as indicated by the average score) show better well-being. The Cronbach's alpha for the scale was .91 (Zheng et al., 2015).

3.3 Procedure

Firstly, Dr. Peg Dawson was contacted to gain permission to adapt and use ESQ-R for the purpose of this study. The study was given approval by the Scientific and Ethical Review Committee of Universiti Tunku Abdul Rahman (ref no: U/SERC/192/2019). The pre-test study was first conducted, after which the required modifications were made to the instrument and then distributed to the participants. The weblink of the online survey, developed using Qualtrics (https://www.qualtrics.com), was circulated via email and the social network (e.g., LinkedIn, Facebook, WhatsApp). A follow-up email was sent to the

participants within a month to bring their attention to the survey had they not taken any action towards it (by either participating in the study or by unsubscribing to the emails). An informed consent form was attached to the beginning of the survey. All participants gave their consent to participate in the study before answering the survey. Participants were also requested to share the questionnaire within their network. To boost likelihood of participation a recruitment poster with the sample requirements was created and circulated on various platforms (Facebook, LinkedIn).

3.4 Analytical Plan

The data were analysed using JASP (ver. 0.11.1) and IBM SPSS (ver. 22.0). Descriptive statistics and inferential statistics were both evaluated. To determine if the suggested 5-factor structure was retained in the context of Malaysia, Confirmatory Factor Analysis (CFA) was run. The Diagonally Weighted Least Squares (DWLS) estimator was preferred over the Maximum Likelihood (ML) estimator. This is because the DWLS estimator is said to yield more precise model inferences and is able to detect structural relationships better even in the event that data are asymmetric to an extent, hence outperforming ML (Li, 2016). Furthermore, large sample sizes are not a requirement for DWLS as opposed to the ML estimator (Li, 2016). The criteria used to assess fit of the model were: evaluation of the overall chi-square to degrees of freedom ratio (less than three), Comparative Fit Index (CFI; more than .95), Tucker-Lewis Index (TLI; more than .95); root-mean-square-error of approximation (RMSEA; less

than or equal to .05), and the standardised root mean square residual (SRMR; less than .08) (Hu & Bentler, 1999; Steiger, 2000; Tabachnick & Fidell, 2007).

Reliability of ESQ-R and other scales were determined using the Cronbach's alpha and McDonald's Omega. To control the influence of wellbeing, a partial correlation analysis was carried out to inquire into the validity of the scale (construct– convergent and discriminant, and concurrent validity). Convergent validity was tested by examining the relationship between ESQ-R (Straits et al., 2019) and EFI (Spinella, 2005) which is a validated, self-rated scale intended for use by the healthy population. Because a relationship between different dimensions of EF and creativity are hinted in literature (e.g., Gilhooly et al., 2007; Krumm et al., 2018; Lee & Therriault, 2013), the self-rated creativity scale (Tan & Ong, 2019) was used to test for discriminant validity. This is done to cement the fact that ESQ-R measures EF and not creativity. UWES-9 (Schaufeli & Bakker, 2003) was used to test for concurrent validity as literature shows a correlation between executive functioning and work engagement (e.g., Parke et al., 2018; Castellano et al., 2019).

CHAPTER 4

RESULTS

4.1 Pre-test Study

Following the development of a questionnaire, it is important to conduct a pretest to identify any potential problems the questionnaire might pose. The authors examined the original item statements of the questionnaire and surmised that the ESQ-R would require slight modifications to better cater to the intended population and ensure comprehensibility. A total of 10 participants were recruited using convenience sampling. An online survey created using Google Forms and was distributed using WhatsApp.

The data was analysed using Microsoft Excel. The total number of votes for the original item was used to compare the original item with the alternative item, a score of 4 and below would indicate that the alternative item is preferred therefore a score equal to or more than 5 would mean that the original item is sufficient for the participants' understanding. A total of four items (items 4, 6, 19, and 24, see Table 4.1) had a score of 4 and less thus indicating that the alternate items provided are more helpful to the understanding of the participant. Hence, the ESQ-R was adapted to include the 4 item statements from the pretest instead of the original. In the instance when both the alternative and original items had equal votes, the decision was to stick with the original item as it shows

that the original need not be changed and it is best to avoid unnecessary amendment to the scale.

Table 4.1

Item Modification for Executive Skills Questionnaire-Revised

Item Number	Original Statement	Score	Modified Statement	Score
4	I have a short fuse.	2	I tend to get angry easily.	8
6	I run out of steam before finishing a task.	3	I lose energy or interest before completing a task.	7
19	I "go with my gut" when making decisions.	2	I trust my instincts when making decisions.	8
24	I miss the big picture.	2	I overlook the whole scenario.	8

Note. N = 10; Score = Number of participants who selected the statement.

4.2 Descriptive Analysis

A total 325 responses (153 males and 171 female, 1 missing value) were used for the analysis. Of the sample, all were working in Malaysia of which 275 were Malaysian while 50 were foreigners. The age range of the participants was from 23 years to 80 years old (M_{age} = 40.342, SD_{age} = 10.385). Majority (70.8%) of the participants hailed from the academic setting, 8.6% of the participants were from business and administration, 8% worked in management positions while the remaining were from other fields (healthcare, hospitality, legal, science

and engineering, and social and cultural). Additional details of the participants'
demographic information is presented in Table 4.2.

Table 4.2

Participants' Demographic Information

Characteristic	*n*	%	Characteristic	*n*	%
Age			*Industry*		
21 – 30	53	16.3	Academic	230	70.8
31 – 40	132	40.6	Business and	28	8.6
			Administration		
41 – 50	80	24.6	Healthcare	8	2.5
51 – 55	25	7.7	Hospitality	1	0.3
>55	29	8.9	Legal	12	3.7
Did not respond	6	1.9	Management	26	8.0
			Science and Engineering	9	2.8
Gender			Social and Cultural	5	1.5
Male	153	47.1	Did not respond	6	1.8
Female	171	52.6			
Did not respond	1	0.3	*Work Experience (Years)*		
			1 – 5	126	39
Nationality			6 – 10	94	29
Malaysian	275	84.6	11 – 15	36	11
Foreigner	50	15.4	16 – 20	42	13
			21 – 25	13	4
			More than 25	14	4

Note. % = Percentage.

4.3 Confirmatory Factor Analysis

To determine the model of best fit, CFA was run using the DWLS estimator. The single-factor model, 5-fator model, and 5-factor second-order model were evaluated to check for fit. A good fit was shown in all models (see Table 4.3). The establishment of a second-order model for executive functioning is insinuated by theory (e.g., Ardila, 2018; Gioia, Isquith, & Guy, 2001; Miller & Cohen, 2001). Moreover, the results of the 1-factor model and 5-factor model suggest that there is an occurrence of a general construct of EF and the need to look deeper into the five factors. Hence, the 5-factor second-order model (see Figure 4.1) is preferable. As demonstrated in Table 4.4, a higher-order factor structure is supported as the bulk of the factors have strong correlations with each other.

Table 4.3

Goodness-of-fit indices for Executive Skills Questionnaire-Revised

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA [90% CI]	SRMR
1. 1-factor model	385.170	275	1.401	.982	.980	.035 [.026, .043]	.071
2. 5-factor model	247.627	265	.934	1.000	1.003	.000 [.000, .016]	.056
3. 5-factor second order model	277.782	270	1.029	.999	.999	.009 [.000, .024]	.059

Note. $N = 325$. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean-square error of approximation; SRMR = standardised root mean square residual; CI: confidence interval. Analysis ran using Diagonally Weighted Least Squares (DWLS) estimator.

Table 4.4

Correlations between the Subscales of Executive Skills Questionnaire-Revised

	1	2	3	4	5
Plan Management	1				
Time Management	.728*	1			
Material Organisation	.468*	.555*	1		
Emotional Regulation	.497*	.380*	.322*	1	
Behavioural Regulation	.440*	.377*	.189*	.364*	1

Note. $N = 325$.

*p < .01
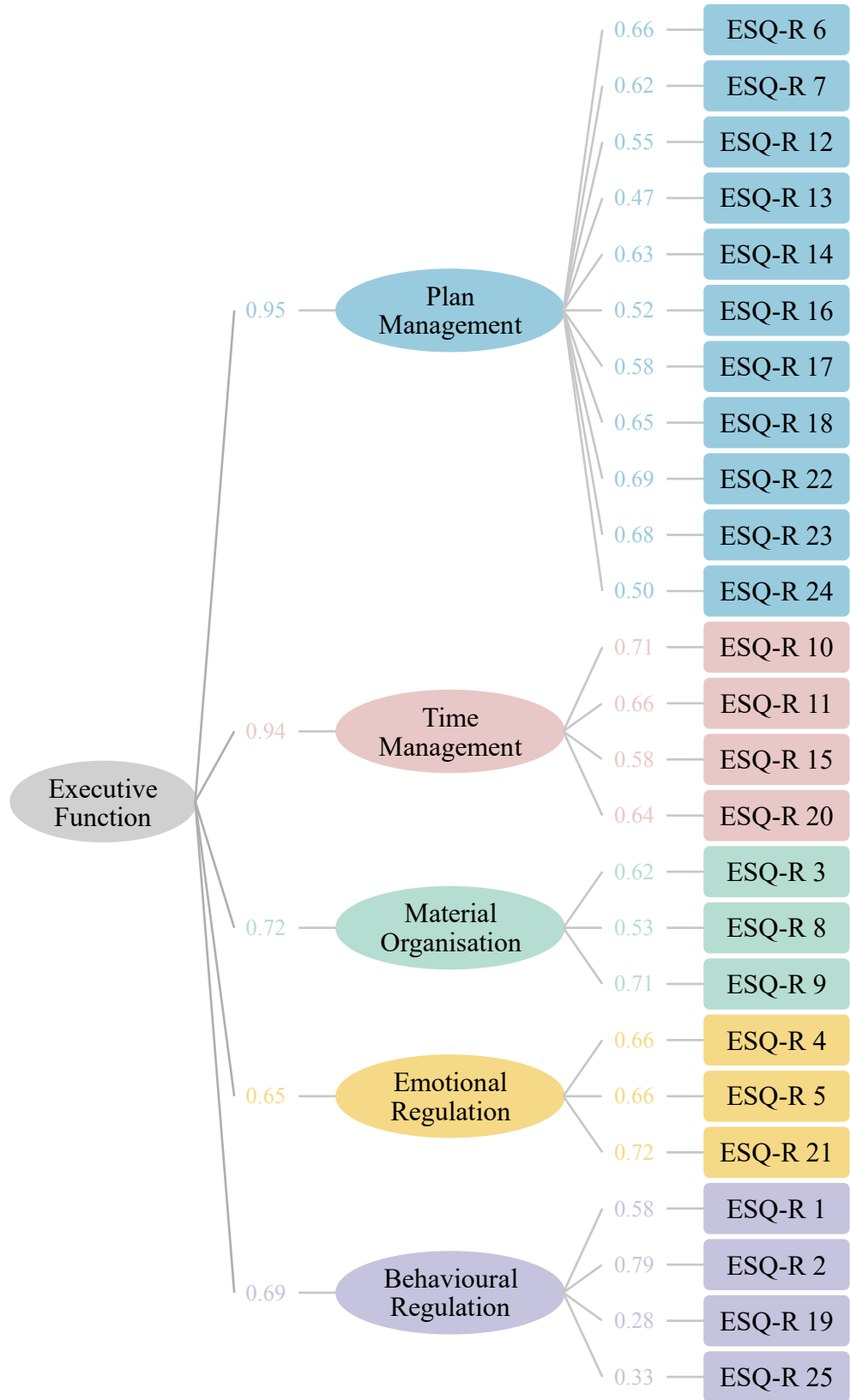
Figure 4.1 The 5-factor second order model.

4.4 Reliability Analysis

Table 4.5 shows the summary of the reliability of the ESQ-R and the subscales. As indicated in the table, the ESQ-R demonstrates excellent internal consistency (α = .901; ω = .907). Similarly, the five dimensions of the ESQ-R also showed adequate reliability with plan management having the strongest reliability (α = .860; ω = .862) and behavioural regulation with the weakest reliability (α = .567; ω = .597).

Table 4.5

Summary of Internal Consistency for Executive Skills Questionnaire-Revised and Subscales

Factor	alpha	omega
ESQ-R	.901	.907
Plan Management	.860	.862
Time Management	.745	.748
Materials Organisation	.693	.726
Emotional Regulation	.732	.741
Behavioural Regulation	.567	.597

Note. N = 325. ESQ-R = Executive Skills Questionnaire-Revised; alpha = Cronbach's alpha; omega = McDonald's omega.

4.5 Validity

To investigate the validity of the ESQ-R, a partial correlation analysis with wellbeing as the control variable was carried out (see Table 4.6). As hypothesised, there was a negative relationship between ESQ-R and EFI. Because ESQ-R measures deficits in executive functioning while EFI measures how good an individuals' EF is, convergent validity is demonstrated by the existent negative correlation. A weak negative relationship was depicted between ESQ-R and self-rated creativity. This demonstrates that while EF may be related to creativity, it is distinct from, as supported by literature, hence establishing discriminant validity. Lastly, the negative relationship between ESQ-R and UWES-9 shows evidence for concurrent validity.

Table 4.6

Descriptive Statistics, Partial Correlations, and Cronbach Alpha Coefficients for Variables

Variables	N	M	SD	SK [std. error]	Kurtosis [std. error]	α	1	2	3
1. ESQ-R	325	20.535	10.268	.768 [.135]	.717 [.270]	.901			
2. EFI	308	101.750	11.197	.145 [.139]	-.006 [.277]	.802	-.533***		
3. SRCS	303	3.791	.620	-.429 [.140]	.604 [.279]	.939	-.141*	.277***	
4. UWES-9	305	4.259	1.040	-.778 [.140]	.686 [.278]	.930	-.147*	.303***	.244***

Note. Employee Well-being Scale (EWB) as control. ESQ-R = Executive Skills Questionnaire-Revised; EFI = Executive Function Index; UWES-9 = Utretch Work Engagement Scale-9; SRCS = Self-Rated Creativity Scale; *N* = sample size; *M* = mean; *SD* = standard deviation; *SK* = skewness; α = Cronbach alpha.
*p < .05, ***p < .001.

CHAPTER 5

DISCUSSION

This research was conducted, in a sample of working adults in Malaysia, to investigate the psychometric properties of the Executive Skills Questionnaire-Revised (ESQ-R). Preceding measures of executive functioning were mostly established in a clinical manner, consequently this self-rated scale was an ideal choice to study within the general healthy population. The results of the study elucidate the psychometric soundness of the scale thus establishing ESQ-R as a fit measure of EF in the working context of Malaysia.

One of the objective of the study was to determine the best factor structure suited to the working population in Malaysia. To ascertain if the five-factor structure would be consistent in the context of the study, confirmatory factor analyses were run. A good fit was found in all models. While the results of Strait and colleagues (2019) lend support to the 5-factor model, the 5-factor second-order model is most preferable. The 5-factor second-order model has five first-order factors (plan management, time management, materials organisation, emotional regulation, and behavioural regulation) and a general (second-order) factor of EF. Literature suggests the occurrence of a second-order model, the biggest tell lies in the various definitions of EF. Executive functioning has commonly been described as an umbrella term for various cognitive processes/functions that are responsible for goal-orientation, including self-control, behavioural regulation, planning, and organisation skills (e.g., Ardila,

2018; Miller & Cohen, 2001). The mere breakdown of the definition of EF, and the correlations between the factors of ESQ-R suggest that EF is a second-order construct hence supporting the preference for the second-order model. Furthermore, the five factors were substantially correlated and McClain (1995) suggests that a second-order factor analysis becomes necessary when first-order factors are correlated. The advantages of using a second-order model are that a first-order analysis provides a narrow, close-up but detailed view of the data, while the second-order analysis provides a wide and general view, providing a different perspective of the data (Thompson, 1990; 2004). The first-order factors may provide specific features of the data while the second-order factors provide more general one's, hence enabling the researcher to access additional information (Navruz, Capraro, Bicer, & Capraro, 2015).

The ESQ-R was found to have excellent internal consistency, therefore showing promising results for the use of ESQ-R as a reliable measure. The internal consistency estimates (see Figure 4.1) of all the factors were sufficient, however, there is a need to review the factor of behavioural regulation for further development in order to adequately represent it. The wording of the items may be reviewed to increase comprehensibility of the items.

The convergent and discriminant validity results of the study are also promising. According to Hemphill (2003), the correlation coefficients can be split into thirds, the first third depicting a weak relationship being less than .20, the second third depicting a moderate relationship being between .20 and .30, and lastly the last third depicting a strong relationship with $r > .30$. Convergent

validity is to study the new measure against an established measure of the same construct and determine how well it fares, in the case of this study the established measure of EF was EFI. A negative relationship between ESQ-R and EFI signified convergent validity of the scale. ESQ-R demonstrates deficits in executive functioning whereas EFI indicates strength in executive functioning, in other words, an individual with good executive functioning would have a low score on the ESQ-R and a high score on the EFI, hence substantiating the negative correlation. The result confirms that ESQ-R is in fact a measure of EF as intended.

The purpose of observing discriminant validity is to further reinstate that ESQ-R is a measure of EF and not of other constructs (e.g., creativity). The correlation between executive functioning and self-rated creativity lent support to discriminant validity. In line with former research that state creativity requires EF (Nusbaum, & Silvia, 2011; Gilhooly et al., 2007), the present study revealed a weak relationship between the creativity and EF scores based on Hemphill's (2003) benchmarking of the correlation coefficient being less than .20. That is to say, the ESQ-R score is not overlapping with a creativity score. This supports that the ESQ-R is a measurement of EF but not creativity.

The statistically significant relationship between the ESQ-R and the Utretch Work Engagement Scale scores provides evidence of concurrent validity. This shows that ESQ-R succeeds as a sound scale as it had a significant correlation with an already psychometrically sound measurement scale that is UWES-9. The result is consistent with past studies depicting the relationship

between executive functioning and engagement. Hence, it is recommended that researchers utilize the ESQ-R to study the relationship between executive functioning and work engagement across different work settings.

Overall, all the objectives of the study were met. The implications are that this is the first study validating the ESQ-R among working adults in the Malaysian context. In the original development of the scale, it was administered to school goers whereas in this study it was administered to the working adult population, thus demonstrating its versatility in terms of its intended population. The sound psychometric properties (e.g., excellent reliability and validity) of the measurement tool, corroborate the standard of the scale and bolster its generalisability. Further contributions of the study are that organisations can now use the scale to explore executive functioning within the organisation and can depend upon its use for various purposes (e.g., selection and recruitment, promotion, training, etc.). Being an intervention focused measurement tool, the use of ESQ-R would allow organisations to formulate intervention plans based on the employees' EF, as well as evaluate and monitor the intervention progress.

5.1 Limitations and Suggestions

Limitations of the study are that the data was confined to a particular group with similar demographics as data was mostly collected from the education industry (70.9%; e.g., lecturers, teachers, tutors, etc.), in consequence restricting the generalisability of the results. A recommendation for future studies is to focus on greater representativeness by replicating the study with

participants from various industries. In addition, it would also be advantageous to recruit participants of different ethnic groups, regions, and countries, in order to assess cross-cultural applicability of the ESQ-R. Creating translations of the scale into different languages particular to a certain region would allow researchers to have a greater reach in collecting data.

The main goal of any given organisation is to select the best candidate for the job who can provide their maximum utility, for this the selection process must have an aspect of predictability (Ekuma, 2012). On that account, it would be beneficial to study and determine the predictive validity of the ESQ-R. For example, organisations may use the ESQ-R during the hiring stage and later examine its relationship with job performance of the employee. Further studies need to be done to establish the robustness of the scale.

CHAPTER 6

CONCLUSION

The ESQ-R is a psychometrically sound scale that may be used to study the executive functioning of an employee. The scale shows excellent internal consistency and adequate validity. Contrary to the study by Strait and colleagues (2019), the 5-factor second-order structure is favoured. The present study provides evidence for a scale of executive functioning to be used within the working context of Malaysia, hence allowing for the furthering of research. Moreover, the scale may be used to draft intervention programmes to accommodate individuals with deficits in executive functioning.

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APPENDIX A

Directory Of Executive Professionals

MAJOR GROUP 1 MANAGERS

1 MANAGERS

- **11 CHIEF EXECUTIVES, SENIOR OFFICIALS AND LEGISLATORS**
  - 111 LEGISLATORS AND SENIOR OFFICIALS
  - 112 MANAGING DIRECTORS AND CHIEF EXECUTIVES

- **12 ADMINISTRATIVE AND COMMERCIAL MANAGERS**
  - 121 BUSINESS SERVICES AND ADMINISTRATION MANAGERS
  - 122 SALES, MARKETING AND DEVELOPMENT MANAGERS

- **13 PRODUCTION AND MANUFACTURING MANAGERS**
  - 131 PRODUCTION MANAGERS
  - 132 MANUFACTURING, MINING, CONSTRUCTION AND DISTRIBUTION MANAGERS

- **14 HOSPITALITY, RETAIL AND OTHER SERVICES MANAGERS**
  - 141 HOTEL AND RESTAURANT MANAGERS
  - 142 RETAIL AND WHOLESALE TRADE MANAGERS

- **15 INFORMATION AND COMMUNICATIONS TECHNOLOGY MANAGERS**
  - 151 INFORMATION AND COMMUNICATIONS TECHNOLOGY MANAGERS

- **16 SERVICES MANAGERS**
  - 161 PROFESSIONAL SERVICE MANAGERS
  - 162 OTHER SERVICES MANAGERS

MAJOR GROUP 1 MANAGERS

1 MANAGERS

- **11 CHIEF EXECUTIVES, SENIOR OFFICIALS AND LEGISLATORS**
- **12 ADMINISTRATIVE AND COMMERCIAL MANAGERS**
- **13 PRODUCTION AND MANUFACTURING MANAGERS**
- **14 HOSPITALITY, RETAIL AND OTHER SERVICES MANAGERS**
  - 141 HOTEL AND RESTAURANT MANAGERS
    - 1411 Hotel Managers
    - 1412 Restaurant Managers
  - 142 RETAIL AND WHOLESALE TRADE MANAGERS
    - 1421 Retail and Wholesale Trade Managers
- **15 INFORMATION AND COMMUNICATIONS TECHNOLOGY MANAGERS**
  - 151 INFORMATION AND COMMUNICATIONS TECHNOLOGY MANAGERS
    - 1511 Information and Communications Technology Managers
- **16 SERVICES MANAGERS**
  - 161 PROFESSIONAL SERVICES MANAGERS
    - 1611 Child Care Services Managers
    - 1612 Health Services Managers
    - 1613 Aged Care Services Managers
    - 1614 Social Welfare Managers
    - 1615 Education Managers
    - 1616 Financial and Insurance Services Branch Managers
    - 1617 Legal Managers
    - 1618 Property Managers
    - 1619 Professional Services Managers Not Elsewhere Classified
  - 162 OTHER SERVICES MANAGERS
    - 1621 Sports and Recreation Centre Managers
    - 1622 Personal Care, Cleaning and Related Services Managers
    - 1623 Security Managers
    - 1624 Cultural Centre, Museum and Library Managers
    - 1629 Other Services Managers Not Elsewhere Classified

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MAJOR GROUP 2
PROFESSIONALS

2
PROFESSIONALS

21 SCIENCE AND ENGINEERING PROFESSIONALS
- **211** PHYSICISTS, CHEMISTS AND RELATED PROFESSIONALS
- **212** MATHEMATICIANS, ACTUARIES AND STATISTICIANS
- **213** LIFE SCIENCE PROFESSIONALS
- **214** ENGINEERING PROFESSIONALS (EXCLUDING ELECTROTECHNOLOGY)
- **215** ELECTROTECHNOLOGY ENGINEERS
- **216** ARCHITECTS, PLANNERS, SURVEYORS AND DESIGNERS
- **217** SHIP, AIRCRAFT AND TRAIN LOCOMOTIVE CONTROLLERS
- **218** MINING, MANUFACTURING AND CONSTRUCTION PROFESSIONALS

22 HEALTH PROFESSIONALS
- **221** MEDICAL DOCTORS
- **222** NURSING AND MIDWIFERY PROFESSIONALS
- **223** TRADITIONAL AND COMPLEMENTARY MEDICINE PROFESSIONALS
- **224** PARAMEDICAL PRACTITIONERS
- **225** VETERINARIANS
- **226** OTHER HEALTH PROFESSIONALS

23 TEACHING PROFESSIONALS
- **231** UNIVERSITY AND HIGHER EDUCATION TEACHING PROFESSIONALS
- **232** VOCATIONAL EDUCATION TEACHERS
- **233** SECONDARY EDUCATION TEACHERS
- **234** PRIMARY SCHOOL AND EARLY CHILDHOOD TEACHERS
- **235** MUSIC, ARTS AND PERFORMING ARTS TEACHERS
- **236** LANGUAGE TEACHERS
- **237** RELIGIOUS TEACHERS
- **238** TECHNOLOGY SKILL AND TECHNICAL TRAINERS
- **239** OTHER TEACHING PROFESSIONALS

24 BUSINESS AND ADMINISTRATION PROFESSIONALS
- **241** FINANCE PROFESSIONALS
- **242** ADMINISTRATION PROFESSIONALS
- **243** SALES, MARKETING AND PUBLIC RELATIONS PROFESSIONALS

25 INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS
- **251** SOFTWARE AND APPLICATION DEVELOPERS AND ANALYSTS
- **252** DATABASE AND NETWORK PROFESSIONALS

26 LEGAL PROFESSIONALS
- **261** LEGAL PROFESSIONALS

27 HOSPITALITY AND RELATED SERVICES PROFESSIONALS
- **271** HOTEL AND RESTAURANT PROFESSIONALS

28 SOCIAL AND CULTURAL PROFESSIONALS
- **281** LIBRARIANS, ARCHIVISTS AND CURATORS
- **282** SOCIAL AND RELIGIOUS PROFESSIONALS
- **283** AUTHORS, JOURNALISTS AND LINGUISTS
- **284** CREATIVE AND PERFORMING ARTISTS

29 REGULATORY GOVERNMENT PROFESSIONALS
- **291** REGULATORY GOVERNMENT PROFESSIONALS

MAJOR GROUP 2 PROFESSIONALS

2 PROFESSIONALS

- **21** SCIENCE AND ENGINEERING PROFESSIONALS
- **22** HEALTH PROFESSIONALS
- **23** TEACHING PROFESSIONALS
- **24** BUSINESS AND ADMINISTRATION PROFESSIONALS
- **25** INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS
- **26** LEGAL PROFESSIONALS
- **27** HOSPITALITY AND RELATED SERVICES PROFESSIONALS
- **28** SOCIAL AND CULTURAL PROFESSIONALS
- **29** REGULATORY GOVERNMENT PROFESSIONALS

211 PHYSICISTS, CHEMISTS AND RELATED PROFESSIONALS
- 2111 Physicists and Astronomers
- 2112 Meteorologists and Seismologists
- 2113 Chemists
- 2114 Geologist and Geophysicists

212 MATHEMATICIANS, ACTUARIES AND STATISTICIANS
- 2121 Mathematicians, Actuaries and Statisticians

213 LIFE SCIENCE PROFESSIONALS
- 2131 Biologist, Botanists, Zoologists and Related Professionals
- 2132 Farming, Forestry and Fisheries Advisers
- 2133 Environmental Protection Professionals
- 2134 Pharmacologists, Pathologists and Related Professionals

214 ENGINEERING PROFESSIONALS (EXCLUDING ELECTROTECHNOLOGY)
- 2141 Industrial and Production Engineers
- 2142 Civil Engineers
- 2143 Environmental Engineers
- 2144 Mechanical Engineers
- 2145 Chemical Engineers
- 2146 Mining Engineers, Metallurgists and Related Professionals
- 2149 Engineering Professionals (Excluding Electrotechnology) Not Elsewhere Classified

215 ELECTROTECHNOLOGY ENGINEERS
- 2151 Electrical Engineers
- 2152 Electronic Engineers
- 2153 Telecommunications Engineers

216 ARCHITECTS, PLANNERS, SURVEYORS AND DESIGNERS
- 2161 Building Architects
- 2162 Landscape Architects
- 2163 Product and Garment Designers
- 2164 Town and Traffic Planners
- 2165 Cartographers and Surveyors
- 2166 Graphic and Multimedia Designers

217 SHIP, AIRCRAFT AND TRAIN/LOCOMOTIVE CONTROLLERS
- 2171 Ship Engineers
- 2172 Ship Deck Officers and Pilots
- 2173 Aircraft Pilots and Related Professionals
- 2174 Air Traffic Controllers
- 2175 Train/ Locomotive Controllers
- 2179 Transport Controllers Not Elsewhere Classified

218 MINING, MANUFACTURING AND CONSTRUCTION PROFESSIONALS
- 2181 Mining Professionals
- 2182 Manufacturing Professionals
- 2183 Construction Professionals

MAJOR GROUP 2
PROFESSIONALS

2 PROFESSIONALS

- **21** SCIENCE AND ENGINEERING PROFESSIONALS
- **22** HEALTH PROFESSIONALS
  - **221** MEDICAL DOCTORS
    - **2211** Generalist Medical Practitioners
    - **2212** Specialist Medical Practitioners
  - **222** NURSING AND MIDWIFERY PROFESSIONALS
    - **2221** Nursing Professionals
    - **2222** Midwifery Professionals
  - **223** TRADITIONAL AND COMPLEMENTARY MEDICINE PROFESSIONALS
    - **2231** Traditional and Complementary Medicine Professionals
  - **224** PARAMEDICAL PRACTITIONERS
    - **2241** Paramedical Practitioners
  - **225** VETERINARIANS
    - **2251** Veterinarians
  - **226** OTHER HEALTH PROFESSIONALS
    - **2261** Dentists
    - **2262** Pharmacists
    - **2263** Environmental and Occupational Health and Hygiene Professionals
    - **2264** Physiotherapists
    - **2265** Dieticians and Nutritionists
    - **2266** Audiologists and Speech Therapists
    - **2267** Optometrists and Ophthalmic Opticians
    - **2268** Occupational Therapists
    - **2269** Health Professionals Not Elsewhere Classified
- **23** TEACHING PROFESSIONALS
- **24** BUSINESS AND ADMINISTRATION PROFESSIONALS
- **25** INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS
- **26** LEGAL PROFESSIONALS
- **27** HOSPITALITY, AND RELATED SERVICES PROFESSIONALS
- **28** SOCIAL AND CULTURAL PROFESSIONALS
- **29** REGULATORY GOVERNMENT PROFESSIONALS

**MAJOR GROUP 2
PROFESSIONALS**

**2
PROFESSIONALS**

- **21** SCIENCE AND ENGINEERING PROFESSIONALS
- **22** HEALTH PROFESSIONALS
- **23** TEACHING PROFESSIONALS
- **24** BUSINESS AND ADMINISTRATION PROFESSIONALS
- **25** INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS
- **26** LEGAL PROFESSIONALS
- **27** HOSPITALITY AND RELATED SERVICES PROFESSIONALS
- **28** SOCIAL AND CULTURAL PROFESSIONALS
- **29** REGULATORY GOVERNMENT PROFESSIONALS

Under 23 TEACHING PROFESSIONALS:

- **231** UNIVERSITY AND HIGHER EDUCATION TEACHING PROFESSIONALS
  - **2311** University and Higher Education Teaching Professionals
- **232** VOCATIONAL EDUCATION TEACHERS
  - **2321** Vocational Education Teachers
- **233** SECONDARY EDUCATION TEACHERS
  - **2331** Secondary Education Teachers
- **234** PRIMARY SCHOOL AND EARLY CHILDHOOD TEACHERS
  - **2341** Primary School Teachers
  - **2342** Early Childhood Educators
- **235** MUSIC, ARTS AND PERFORMING ARTS TEACHERS
  - **2351** Music Teachers
  - **2352** Arts Teachers
  - **2353** Performing Arts Teachers
- **236** LANGUAGE TEACHERS
  - **2361** Language Teachers
- **237** RELIGIOUS TEACHERS
  - **2371** Religious Teachers
- **238** TECHNOLOGY SKILL AND TECHNICAL TRAINERS
  - **2381** Vocational Training Officers
- **239** OTHER TEACHING PROFESSIONALS
  - **2391** Education Methods Specialists
  - **2392** Special Needs Teachers
  - **2393** Information Technology Trainers
  - **2399** Teaching Professionals Not Elsewhere Classified

MAJOR GROUP 2 PROFESSIONALS

2 PROFESSIONALS

- **21** SCIENCE AND ENGINEERING PROFESSIONALS
- **22** HEALTH PROFESSIONALS
- **23** TEACHING PROFESSIONALS
- **24** BUSINESS AND ADMINISTRATION PROFESSIONALS
- **25** INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS
- **26** LEGAL PROFESSIONALS
- **27** HOSPITALITY AND RELATED SERVICES PROFESSIONALS
- **28** SOCIAL AND CULTURAL PROFESSIONALS
- **29** REGULATORY GOVERNMENT PROFESSIONALS

241 FINANCE PROFESSIONALS
- **2411** Accountants
- **2412** Financial and Investment Advisers
- **2413** Financial Analysts

242 ADMINISTRATION PROFESSIONALS
- **2421** Management and Organisation Analysts
- **2422** Policy Administration Professionals
- **2423** Personnel and Career Professionals
- **2424** Training and Staff Development Professionals
- **2425** Administrative Professionals
- **2426** Research and Development Professionals

243 SALES, MARKETING AND PUBLIC RELATIONS PROFESSIONALS
- **2431** Advertising and Marketing Professionals
- **2432** Public Relations Professionals
- **2433** Technical and Medical Sales Professionals (Excluding ICT)
- **2434** Information and Communications Technology (ICT) Sales Professionals

251 SOFTWARE AND APPLICATION DEVELOPERS AND ANALYSTS
- **2511** Systems Analysts
- **2512** Software Developers
- **2513** Web and Multimedia Developers
- **2514** Application Programmers
- **2519** Software and Application Developers and Analysts Not Elsewhere Classified

252 DATABASE AND NETWORK PROFESSIONALS
- **2521** Database Designers and Administrators
- **2522** Information Technology System Administrators
- **2523** Computer Network Professionals
- **2529** Database and Network Professionals Not Elsewhere Classified

261 LEGAL PROFESSIONALS
- **2611** Lawyers
- **2612** Judges
- **2619** Legal Professionals Not Elsewhere Classified

MAJOR GROUP 2
PROFESSIONALS

2
PROFESSIONALS

| 21 SCIENCE AND ENGINEERING PROFESSIONALS | 22 HEALTH PROFESSIONALS | 23 TEACHING PROFESSIONALS | 24 BUSINESS AND ADMINISTRATION PROFESSIONALS | 25 INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS | 26 LEGAL PROFESSIONALS | 27 HOSPITALITY AND RELATED SERVICES PROFESSIONALS | 28 SOCIAL AND CULTURAL PROFESSIONALS | 29 REGULATORY GOVERNMENT PROFESSIONALS |

271 HOTEL AND RESTAURANT PROFESSIONALS
- 2711 Hotel Professionals
- 2712 Restaurant Professionals

281 LIBRARIANS, ARCHIVISTS AND CURATORS
- 2811 Archivists and Curators
- 2812 Librarians and Related Information Professionals

282 SOCIAL AND RELIGIOUS PROFESSIONALS
- 2821 Economists
- 2822 Sociologists, Anthropologists and Related Professionals
- 2823 Philosophers, Historians and Political Scientists
- 2824 Psychologists
- 2825 Social Work and Counselling Professionals
- 2826 Religious Professionals

283 AUTHORS, JOURNALISTS AND LINGUISTS
- 2831 Authors and Related Writers
- 2832 Journalists
- 2833 Translators, Interpreters and Other Linguists

284 CREATIVE AND PERFORMING ARTISTS
- 2841 Visual Artists
- 2842 Musicians, Singers and Composers
- 2843 Dancers and Choreographers
- 2844 Film, Stage and Related Directors and Producers
- 2845 Actors
- 2846 Announcers on Radio, Television and Other Media
- 2847 Clowns, Magicians, Acrobats and Related Professionals
- 2848 Animal Keepers and Trainers
- 2849 Creative and Performing Artists Not Elsewhere Classified

291 REGULATORY GOVERNMENT PROFESSIONALS
- 2911 Professional Customs and Border Inspectors
- 2912 Professional Taxation and Excise Officials
- 2913 Professional Government Social Benefit Officials
- 2914 Professional Government Licensing Officials
- 2915 Professional Police Inspectors and Detectives
- 2916 Professional Civil Defence Officials
- 2919 Regulatory Government Professionals Not Elsewhere Classified

APPENDIX B

Letter of Ethical Approval

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/192/2019

25 September 2019

Dr Tan Chee Seng
Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak

Dear Dr Tan,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under <u>expedited review</u>.

The details of your research project are as follows:

Research Title	Examining the Psychometric Properties of the Executive Skills Questionnaire-Revised (ESQ-R) in Malaysian Working Adults
Investigator(s)	Dr Tan Chee Seng Mr Pheh Kai Shuen Hira Nasir (UTAR Postgraduate Student)
Research Area	Social Sciences
Research Location	Malaysia
No of Participants	450 participants (Age: 18 - 55)
Research Costs	Self-funded
Approval Validity	25 September 2019 - 24 September 2020

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research,

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

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Should you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

Yours sincerely,

Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c   Dean, Faculty of Arts and Social Science
       Director, Institute of Postgraduate Studies and Research

APPENDIX C

Approval from Dr Peg Dawson

Re: Requesting permission to adapt and use Executive Skills Questionnaire

Peg Dawson <dawson.peg@gmail.com>
Thu 13/06/2019 03:04
To: Hira Nasir <hiranasir96@outlook.com>
Hi Hira,

Yes, you can adapt and use the rating scale. If you publish your results, I would appreciate a copy of the publication.

Best, Peg Dawson

> On Jun 12, 2019, at 2:12 PM, Hira Nasir <hiranasir96@outlook.com> wrote:
>
> Dear Dr. Dawson,
>
> My name is Hira Nasir, I am a graduate student in industrial and organisational psychology at Universiti Tunku Abdul Rahman, Malaysia.
>
> I was reading your paper "Refinement and Psychometric Evaluation of the Executive Skills Questionnaire-Revised" and find myself interested in evaluating the psychometric properties of the revised scale in the working adult population in Malaysia for my graduate dissertation. I would like to seek your kind permission to adapt, use and evaluate the questionnaire for my study.
>
> I would greatly appreciate your advice on doing so and look forward to hearing from you.
>
> Thank you.
>
> Kind Regards,
> Hira Nasir
> Master of Psychology (Industrial and Organisational Psychology)
> Department of Psychology and Counselling
> Faculty of Arts and Social Science
> Universiti Tunku Abdul Rahman

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Pilot Study Questionnaire

Executive Skills Questionnaire-Revised

Read each item and decide which statement is easier to understand. Please tick the preferred statement.

1	I act on impulse.	
	I act on a sudden feeling or thought, without planning it.	
4	I have a short fuse.	
	I have a tendency to get angry easily.	
6	I run out of steam before finishing a task.	
	I lose the energy or interest in continuing the task.	
19	I "go with my gut" when making decisions.	
	I trust my instincts when making decisions.	
20	I get so wrapped up in what I'm doing that I forget about other things I need to do.	
	I focus all my attention on what I'm doing that I forget about other things I need to do.	
22	I have trouble getting back on track if I'm interrupted.	
	I have trouble continuing work as planned if I'm interrupted.	
24	I miss the big picture.	
	I overlook the situation as a whole.	
25	I live in the moment.	
	I concentrate on the present situation.	

Please provide your feedback (if any) here:

....

APPENDIX E

Informed Consent

Informed Consent Form For Participants of the Research:
"Examining the Psychometric Properties of the Executive Skills Questionnaire-Revised in the Malaysian Working Context"

We, of Universiti Tunku Abdul Rahman, invite you to be a part of our research. We are investigating the psychometric properties of the Executive Skills Questionnaire-Revised (ESQ-R) in the Malaysian working adult context. Before you decide to partake in the research, you can talk to anyone you feel comfortable with about the research. The decision to join, or not to join, is entirely up to you.

The purpose of this research is to offer insight into the psychometric properties of the ESQ-R in the Malaysian context and to provide a validated scale for executive functioning to organisations. If you decide to participate, this research will require you to complete a number of questions. It would approximately take about 20 minutes to complete. The researchers may stop the study or take you out of the study at any time they judge it is in your best interest. They can do this without your consent. You may withdraw from the research at any time. If you withdraw, you will not lose any benefits nor will you receive any penalty.

There are no perceived physical or non-physical risks from taking part in this study. However, there may be risks that we cannot predict.

There is no guarantee that you will personally benefit from participating in this research, but your participation will likely help us find out more about the Executive Skills Questionnaire-Revised. Others may benefit from the information we gain from this study.

The information that will be collected from this research will be kept confidential and will not be shared with anyone outside of the research team.

Your participation in this research is voluntary. You have the right not to participate at all or leave the study at any time. If you have any questions you may contact any of the following: Hira Nasir, hira.nasir@1utar.my ; Tan Chee Seng, tcseng@utar.edu.my; Pheh Kai Shuen, phehks@utar.edu.my.

I have read the foregoing information. I have had the opportunity to ask questions about it and have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

○ I agree to participate in this study and authorize the record review, publication and re-utilisation of data, information and sample storage and data transfer as described above.

○ I DO NOT agree and wish to leave the study.

APPENDIX F

Demographic Information

Following are some questions about your general demographic information.

1. Age:

_____

2. Gender

○ Male

○ Female

3. Ethnicity

_____

4. What is your occupation?

_____

5. How many years have you been working in an executive position?

_____

6. Are you a Malaysian?

○ Yes

○ No

7. Are you currently working in Malaysia?

○ Yes

○ No

APPENDIX G

Questionnaire

Read each item and decide how often it's a problem for you. Please rate each of them from 0 (**Never or Rarely**) to 3 (**Very Often**) using the scale below. Please choose one option below, and circle the number next to the item.

Never or Rarely	Sometimes	Often	Very Often
0	1	2	3

1	I act on impulse.	0	1	2	3
2	I say things without thinking.	0	1	2	3
3	I lose things.	0	1	2	3
4	I tend to get angry easily.	0	1	2	3
5	I get upset when things don't go as planned.	0	1	2	3
6	I lose energy or interest before completing a task.	0	1	2	3
7	It is hard for me to set priorities when I have a lot of things to do.	0	1	2	3
8	My desk or work space is a mess.	0	1	2	3
9	I have trouble keeping my house or room clean.	0	1	2	3
10	I have trouble estimating how long it will take to complete a task.	0	1	2	3
11	I'm slow at getting ready for work, or appointments.	0	1	2	3
12	If the first solution to a problem doesn't work, I have trouble thinking of a different one.	0	1	2	3
13	I skip checking my work for mistakes, even when the stakes are high.	0	1	2	3
14	I get annoyed when tasks are too hard.	0	1	2	3

15	It's hard for me to put aside fun activities to start things I need to do.	0	1	2	3
16	I have trouble with tasks where I have to come up with my own ideas.	0	1	2	3
17	It's hard for me to tell how well I'm doing on a task.	0	1	2	3
18	I have trouble reaching long-term goals.	0	1	2	3
19	I trust my instincts when making decisions.	0	1	2	3
20	I get so wrapped up in what I'm doing that I forget about other things I need to do.	0	1	2	3
21	Little things frustrate me.	0	1	2	3
22	I have trouble getting back on track if I'm interrupted.	0	1	2	3
23	I have trouble making a plan.	0	1	2	3
24	I overlook the whole scenario.	0	1	2	3
25	I live in the moment.	0	1	2	3

Rate how well each of the following statements describes you. Please rate each of them from 1 (**Not at all**) to 5 (**Very much**) using the scale below. Please choose one option below, and circle the number next to the item.

Not at all		Somewhat		Very much
1	2	3	4	5

1	I have a lot of enthusiasm to do things.	1	2	3	4	5
2	When doing several things in a row, I mix up the sequence	1	2	3	4	5
3	I try to plan for the future	1	2	3	4	5
4	I can sit and do nothing for hours.	1	2	3	4	5
5	I take risks, sometimes for fun.	1	2	3	4	5
6	I have trouble when doing two things at once, multi-tasking	1	2	3	4	5
7	I'm interested in doing new things.	1	2	3	4	5
8	I have a lot of concern for the well being of other people.	1	2	3	4	5
9	I'm an organized person.	1	2	3	4	5
10	I save money on a regular basis.	1	2	3	4	5
11	I do or say things that others find embarrassing.	1	2	3	4	5
12	People who are foolish enough to be taken advantage of deserve it.	1	2	3	4	5
13	I only have to make a mistake once in order to learn from it.	1	2	3	4	5

14	I tend to be an energetic person.	1	2	3	4	5
15	I make inappropriate sexual advances or flirtatious comments.	1	2	3	4	5
16	When someone is in trouble, I feel the need to help them.	1	2	3	4	5
17	I sometimes I lose track of what I'm doing.	1	2	3	4	5
18	I feel protective towards a friend who is being treated badly.	1	2	3	4	5
19	I think about the consequences of an action before I do it.	1	2	3	4	5
20	I lose my temper when I get upset.	1	2	3	4	5
21	I take other people's feelings into account when I do something.	1	2	3	4	5
22	I have trouble summing up information in order to make a decision with it.	1	2	3	4	5
23	I start things, but then lose interest and do something else.	1	2	3	4	5
24	I swear/use obscenities.	1	2	3	4	5
25	I don't like it if my actions or words hurt someone else	1	2	3	4	5
26	I use strategies to remember things.	1	2	3	4	5
27	I monitor myself so that I can catch any mistakes.	1	2	3	4	5

The following 9 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the '0' (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

	Almost never	Rarely	Sometimes	Often	Very often	Always
0	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Everyday

1. _____ At my work, I feel bursting with energy

2. _____ At my job, I feel strong and vigorous

3. _____ I am enthusiastic about my job

4. _____ My job inspires me

5. _____ When I get up in the morning, I feel like going to work

6. _____ I feel happy when I am working intensely

7. _____ I am proud on the work that I do

8. _____ I am immersed in my work

9. _____ I get carried away when I'm working

Here are a number of statements that may or may not apply to you. Please select a number from **1 (strongly disagree)** to **5 (strongly agree)** for each statement to indicate the extent to which you agree or disagree with that statement.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	2	3	4	5	

1	I suggest new ways to achieve goals or objectives.	1 2 3 4 5
2	I come up with new and practical ideas to improve performance.	1 2 3 4 5
3	I search out new technologies, processes, techniques, and/or product ideas.	1 2 3 4 5
4	I suggest new ways to increase quality of work.	1 2 3 4 5
5	I am a good source of creative ideas.	1 2 3 4 5
6	I am not afraid to take risks.	1 2 3 4 5
7	I promote and champion ideas to others.	1 2 3 4 5
8	I exhibit creativity on the work when given the opportunity to.	1 2 3 4 5
9	I develop adequate plans and schedules for the implementation of new ideas.	1 2 3 4 5
10	I often have new and innovative ideas.	1 2 3 4 5
11	I come up with creative solutions to problems.	1 2 3 4 5
12	I often have a fresh approach to problems.	1 2 3 4 5
13	I suggest new ways of performing work tasks.	1 2 3 4 5

Below are 18 statements about your current status. Please rate each of them from 1 (**strongly disagree**) to 7 (**strongly agree**) using the scale below. Please choose one option below, and circle the number next to the item.

Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1	2	3	4	5	6	7

#	Statement	Scale
1	I feel satisfied with my life.	1 2 3 4 5 6 7
2	I am close to my dream in most aspects of my life.	1 2 3 4 5 6 7
3	Most of the time, I do feel real happiness.	1 2 3 4 5 6 7
4	I am in a good life situation.	1 2 3 4 5 6 7
5	My life is very fun.	1 2 3 4 5 6 7
6	I would hardly change my current way of life in the afterlife.	1 2 3 4 5 6 7
7	I am satisfied with my work responsibilities.	1 2 3 4 5 6 7
8	In general, I feel fairly satisfied with my present job.	1 2 3 4 5 6 7
9	I find real enjoyment in my work.	1 2 3 4 5 6 7
10	I can always find ways to enrich my work.	1 2 3 4 5 6 7
11	Work is a meaningful experience for me.	1 2 3 4 5 6 7
12	I feel basically satisfied with my work achievements in my current job.	1 2 3 4 5 6 7
13	I feel I have grown as a person.	1 2 3 4 5 6 7

14	I handle daily affairs well.	1 2 3 4 5 6 7
15	I generally feel good about myself, and I'm confident.	1 2 3 4 5 6 7
16	People think I am willing to give and to share my time with others.	1 2 3 4 5 6 7
17	I am good a making flexible timetables for my work.	1 2 3 4 5 6 7
18	I love having deep conversations with family and friends so that we can better understand each other.	1 2 3 4 5 6 7