PROACTIVE SAFETY BEHAVIOR OF YOUNG WORKERS

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MSc. (Human Resource Development)

This thesis is presented for the degree of Doctor of Philosophy of The University of Western Australia

UWA Business School

Management and Organisations

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ABSTRACT

Recent research into safety behavior has highlighted the growing importance of employee proactivity in maintaining safety at the workplace. The overarching objective of the research described in this thesis was to develop and test a model of the determinants of proactive safety behavior at an individual level. Following Parker, Bindl & Strauss (2010), proactive safety behavior was conceptualised as a form of goal-oriented self-regulatory behavior involving goal generation and goal striving. Three studies were conducted for this research. Study One adopted an ethnomethodological approach to exploring the daily practices of proactive safety behavior and its antecedents among young Malaysian workers. The data were analyzed using Nvivo and Leximancer, and the findings were used to help guide the subsequent quantitative studies. Study Two was designed to develop and validate quantitative measures of proactive safety behavior and its antecedents, and involved both Malaysian (N=256) and Australian participants (N=274). Study Three was two-wave longitudinal test of a model of the antecedents of proactive safety behavior, conducted using a Malaysian sample (N=215) and analysed using structural equation modelling. The findings provide overall support for a model in which ability, motivation and opportunity factors influence employee proactive safety behavior. This research has contributed immensely in understanding the current situation of safety behavior among the young people and how proactivity can help improve the current working condition. Furthermore, this research can be a preliminary research to understand young workers ability, motivation and opportunity enhancement through self-regulatory process in proactive behavior safety engagement.
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<td>Adjusted Goodness of Fit Index</td>
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<td>AIC</td>
<td>Akaike Information Criteria</td>
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<td>AVE</td>
<td>Average Shared Variance</td>
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<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
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<td>CFI</td>
<td>Comparative Fit Index</td>
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<td>CIT</td>
<td>Critical Incident Technique</td>
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<td>CLF</td>
<td>Common Latent Factor</td>
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<td>CMV</td>
<td>Common Method Variance</td>
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<td>CR</td>
<td>Composite Reliability</td>
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<td>DOSH</td>
<td>Department of Safety and Health</td>
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<td>EFA</td>
<td>Exploratory factor analysis</td>
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<td>GFI</td>
<td>Goodness of Fit Index</td>
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<td>GNI</td>
<td>Gross National Income</td>
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<td>HRDF</td>
<td>Human Resources Development Fund</td>
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<td>ILO</td>
<td>International Labor Organization</td>
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<td>I-PANAS</td>
<td>International-Positive and Negative Affect Schedule-Short</td>
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<td>IRR</td>
<td>Inter-Rater reliability</td>
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<td>MaxR (H)</td>
<td>Maximal Reliability</td>
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<td>MCDA</td>
<td>Membership Categorization Device Analysis</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>MOHE</td>
<td>Ministry of Higher Education</td>
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<td>MOHR</td>
<td>Ministry of Human Resources</td>
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<td>MSV</td>
<td>Maximum Shared Squared Variance</td>
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<td>NCOSH</td>
<td>National Council for Occupational Safety and Health</td>
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<td>PA</td>
<td>Proactive Ability</td>
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<td>PBD</td>
<td>Permanent Disablement Benefit</td>
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<td>Proactive Opportunity</td>
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<td>Personal Protective Equipment</td>
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<td>SRMR</td>
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<td>TPB</td>
<td>Theory of Planned Behavior</td>
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<td>UKM</td>
<td>The National University of Malaysia</td>
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<td>University of Western Australia</td>
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**AUTHORSHIP DECLARATION: SOLE AUTHOR PUBLICATIONS**

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Date: 31/01/2021
Chapter 1

Overview

1.1 Introduction

This thesis aims to contribute to the existing research on proactive behavior in work settings. Specifically, it investigates how the concept of proactive safety behavior can be applied to understand and improve safety outcomes for young workers in a Malaysian context. The increasing number of accidents and injuries involving this age cohort of workers in Malaysia motivates the focus on young workers. It is hypothesized that three variables, proactive ability, proactive motivation, and proactive opportunity, are key influences on individual proactive safety behavior amongst young workers. The thesis reports the findings of three studies. Study 1 (Chapter 5) is an ethnomethodological study aimed at gaining a greater understanding of the nature and determinants of proactive safety behavior as it occurs in a population who are at heightened risk of workplace accidents - young Malaysian workers. Study 2 (Chapter 6) involves developing validating quantitative measures of proactive safety behavior and its proposed antecedents, using samples of young Malaysian and Australian workers. Study 3 (Chapter 7) tests a model of the causal determinants of proactive safety behavior, utilizing a two-wave longitudinal survey design. Finally, in Chapters 8 and 9, the results of the three studies are discussed and conclusions are drawn.
1.2 Aim (s) and background

The global workforce is now increasing in line with the rapid development of the global economy, predominantly in developing countries (ILO, 2019). 80% of the global workforce is located in developing countries (Desai & Rudra, 2019). The majority are young people, with about 90 percent living in developing countries and 60 percent in Asia (ILO, 2018). It has been estimated that more than 340 million workplace accidents and 160 million cases of work-related illnesses recorded reported annually (Cioni & Savioli, 2016).

Within the developing economies, there is a growing concern over the safety and health of younger workers in particular. Studies have shown that young workers are more likely to experience work-related accidents in comparison to older workers (Lewko, Runyan, Tremblay, Staley, & Volpe, 2014; Miller, Handelman, & Lewis, 2007; Turner, Tucker, & Deng, 2020a). This is contributed to by the personality of the young workers, for example, risk-taking (Westaby & Lowe, 2005) physical and psychological development (Sudhinaraset & Blum, 2010), as well as the hazardous work conditions (Lewko et al., 2014). Young workers are also more likely to be at risk of poorer health and safety outcomes by virtue of needing to find work in the ‘Gig’ economy, which only offers temporary contracts and independent contracting thereby diminishing the formal relationship of employment that includes having the employers protect and maintain a safe working environment (Tran & Sokas, 2017; Leitão, Mc Carthy, & Greiner, 2018; Ansah, Mintah, & Ogah, 2018). Although there were numerous studies conducted to examine the emergence of safety behavior from the safety climate perspective such as safety policy, management commitment or safety communication, the studies on proactive safety behavior and its predictors remain unclear. The previous research often explained how safety behavior is externally influenced rather than
Generally, research on safety behavior in the Malaysian context attempted to understand the employers’ role in improving and maintaining workplace safety by monitoring the employees’ safety compliance (Lyu, Hon, Chan, Wong, & Javed, 2018). This approach is conventional, that the employees are expected to follow the predetermined safety procedures (Haas, Eiter, Hoebbel, & Ryan, 2019) and quite common to take place in a high power distance country like Malaysia (Zainuddin, Ismail, Sapiei, & Sapiei, 2013). However, the recent findings also found out that young employees are unique, more innovative and acquired better skills, backed by their relationship to technology (Ngotngamwong, 2020). They have better access to information, empowering, creative and confidence to perform better at work (Khatiwada, 2020). Therefore, it is important to see how such characteristics can help to nurture proactive safety behavior that is self-regulated and internalized rather than environmentally induced like the traditional safety compliance.

The Malaysian total employed population has nearly doubled over the past two decades, increasing to 15.1 million in 2019 compared with 8.1 million in 2000, while the proportion of the working-age population (aged 15-64 years) rose to 68.5 percent in 2019 from 67.3 percent in 2010 (Malaysia, 2019). The Annual Report 2017 by the Social Security Organization (SOCSO) reported that the number of accidents is on the rise to 69980 in 2017 from 66618 in 2016 (SOCSO, 2017). ILO has estimated that the young workers are at a 40% higher risk of experiencing industrial accidents than the older age cohort (ILO, 2018).

Few studies have so far explored the role of proactivity in a safety context, and none have sought to examine the drivers of safety proactivity among younger workers, a demographic that is fast growing in many developing economies and which is at increased risk of poor safety and health outcomes. My research thus addresses the following overarching research question: How can contemporary research and theorizing in respect of proactive behavior be applied to safety behavior
in order to understand and improve safety outcomes at work for young Malaysian workers? In addressing this overarching question, the following specific issues/questions will be examined:

1. What are the core elements of a self-regulatory perspective on proactive safety behavior?
2. How can proactive safety behavior be measured?
3. What are the psychological factors (e.g. ability, motivation) that predispose young Malaysian workers to engage in proactive safety behavior?

1.3 Statement of the problem

Proactive safety behavior is gradually emerging as a new area of research and focus on safety researchers and practitioners. Proactive safety behavior refers to employees being proactive in taking responsibility for improving safety outcomes for themselves and others. Studies of proactive safety behavior have emerged out of a body of work on discretionary work behaviors typically described as safety participation or safety citizenship behaviors (Fugas, Silva, & Meliá, 2013; Griffin & Curcuruto, 2016; Hofmann, Morgeson, & Gerras, 2003a). This research has indicated, first, that organizational safety climate and social norms regarding safety behavior exert a significant influence over the extent to which employees engage in proactive safety behavior. Second, perceived behavioral control and positive attitudes towards safety are also factors influencing proactivity in the safety domain. Third, proactive safety behavior may be conceptualized as both an individual and group-level variable.

Several conclusions can be drawn from the few studies that have been carried out into proactive safety behavior to date (Matteo Curcuruto & Griffin, 2018; Matteo Curcuruto, Parker, & Griffin, 2019; Fugas, Meliá, & Silva, 2011). From a theoretical perspective, there is still a
disjuncture between how proactive behavior and its antecedents and consequences have been conceptualized in the mainstream literature on proactivity (Parker, Bindl, & Strauss, 2010; Strauss & Parker, 2014) and in the literature on proactive safety behavior. For example, studies have yet to fully encapsulate both the motivational antecedents and goal-oriented self-regulatory processes identified as key to proactive work behavior (Bindl & Parker, 2010).

In this thesis, I seek to build on earlier work on proactive safety behavior in several ways. First, I propose a more holistic view of understanding the role of individual antecedents of proactive safety behavior. I propose three proximal antecedents of individual proactive safety behavior: proactive ability, proactive motivation, and proactive opportunity. Proactive ability encompasses elements of an employee’s knowledge, skills, and abilities that enable that person to engage with safety in a proactive manner. Proactive motivation is a concept derived from Strauss & Parker (2014)’s model of effective and sustained proactivity in organizations, which integrates new perspectives on proactive motivational states (Parker et al., 2010) with Self-Determination Theory (SDT: Ryan & Deci, 2000). Following Parker et al. (2010), proactive motivation is seen to involve three different groups of proximal motivational states; ‘reason to,’ ‘can-do,’ and ‘energized to’ engage in proactive safety behavior. From a process perspective, proactive motivation is also associated with the autonomous and controlled motivation of safety. The autonomous motivation of safety is internalized, while controlled motivation is related to the external aspects. Comparing autonomous and controlled motivation, it may be argued that autonomous motivation is likely to be a stronger influence on proactive safety behavior than controlled motivation (Strauss & Parker, 2014). Proactive opportunity, on the other hand, describes the opportunity employees have to engage in proactive safety behavior. For instance, employees vary in terms of the number of resources they are afforded.
Furthermore, in my thesis, I examine proactive safety behavior as a type of goal-oriented self-regulatory behavior (Parker et al., 2010; Strauss & Parker, 2014). Proactive safety behavior within this context refers to goal generation (envisioning and planning) and goal striving (enacting and reflecting). It involves cognitive efforts expended in thinking ahead to anticipate future proactive safety behavior outcomes that represent potential improvements to the organizational status quo (Grant & Ashford, 2008). Such goals are anticipatory and self-initiated and involve bringing about changes to work tasks or the broader organizational context, for example, proactive safety behavior (Bindl & Parker, 2010).

My thesis focuses primarily on proactive safety behavior of young workers in a Malaysian context. As indicated previously, young workers are often particularly vulnerable to being exposed to health and safety risks. The reasons for this include employment arrangements that provide limited safety training and which encourage risk-taking, as well age-related predispositions towards risk-taking. It is important, therefore that we understand more about the psychological factors that underpin self-regulatory proactive safety behaviors by younger workers, since such behaviours are likely to mitigate the risks to which they are exposed and generate better health and safety outcomes. Malaysia provides a useful context for such research, not for any cultural reasons, but because young workers (aged 18-34) make up a large portion of its overall labour market.

The theoretical framework that I propose and aim to test in this thesis empirically is summarised in Figure 1.1.
1.4 Thesis structure

The thesis is presented in eight chapters. In Chapter One, I present the thesis overview, problem statement, research questions, and purpose of the study. In Chapter Two, I review the literature on proactivity and proactive behavior. It emphasizes the antecedents, the outcomes, and the process approach to proactive behavior. Chapter Three contains a literature review on the emerging concept of proactive safety behavior, and I present the overall theoretical framework and guiding hypotheses in Chapter Four.
In Chapter Five I present the first empirical study of this dissertation. The qualitative study seeks to highlight the daily experiences of young Malaysian workers as they relate to safety behavior engagement at work and to identify aspects of proactive safety behavior that they engage in.

In Chapter Six, I describe a second quantitative study that involved Australian and Malaysian participants. The data collection and analysis aimed to validate measures of proactive safety behavior and its proximal psychological and contextual antecedents.

In Chapter Seven, I present the results of a two-wave longitudinal study conducted on young Malaysian workers that sought to test the proposed relationship between measures of worker ability, motivation and opportunity and proactive safety behavior. In this study, I also identify worker engagement as a potential mediator of the relationship between worker ability, motivation and opportunity and proactive safety behavior.

Finally, in Chapter 8, I discuss the overall findings of the three studies and conclude future research.
Chapter 2

Proactive Work Behavior

2.1 Introduction

Proactivity has emerged as a key construct in the organizational behavior and management literatures over the past two decades, largely in response to trends for flatter organizations, the need for organizations to respond agilely to uncertain environments, and increased emphasis on empowerment at work (Crant, 2000; Grant & Ashford, 2008; Strauss & Parker, 2014; Parker & Bindl, 2016; Liu, Tangirala, Lee, & Parker, 2019; Parker, Wang, & Liao, 2019). Initially, researchers were concerned to identify what proactive behavior looked like in organizational settings, and to identify the types of employees who were predisposed to behave proactively. More recently, however, researchers have begun to examine in detail the processes whereby proactive behavior gets initiated, enacted and sustained within organizational settings. This reflects the growing view that individual proactive behavior is dynamic and hence able to be cultivated and supported for beneficial individual and organisational ends.

In this chapter, I provide an overview of the concept of proactivity at work, as it has emerged in the management and organizational behavior works of literature. Next, I review several scholarly works that have sought to bring together theoretical perspectives on proactive goal regulation and motivation in order to describe better the genesis and maintenance of proactive behavior at work. Finally, I conclude that more research is needed into the applicability of such models to specific behavioral contexts, such as safety behavior.
2.2 Defining proactive behavior at work

Proactive behavior has been conceptualized in many ways in the pieces of literature on management and organizational behavior. Bateman & Crant (1993) introduced the construct of proactive behavior as “a dispositional construct that identifies differences among people in the extent to which they take action to influence their environments” (p. 103). Proactive behavior, they argued, has both situational and dispositional causes, and reflects a need within individuals to act in ways that control the environment within which they operate. Whilst not suggesting that proactivity cannot be situationally determined, they argued that certain individuals were inherently proactive, typically seeking to bring about environmental change whilst remaining relatively unaffected by situational demands. Dispositionally proactive people, they argued, are those who continually:

“scan for opportunities, show initiative, take action, and persevere until they reach closure by bringing about change. They are pathfinders (Leavit, 1988) who change their organization’s mission or find and solve problems. They take it upon themselves to have an impact on the world around them” (p. 105).

It is argued that not all employees are proactively disposed of (Bolino, Valcea, & Harvey, 2010), but proactive personality is seen as a key predictor of proactive work behavior (Crant, 1995; Parker & Collins, 2010; Crant & Jiang, 2017).

Bateman & Crant (1999) described proactive behaviors in business settings in similar terms. Proactively disposed individuals, they suggested (based on interviews with entrepreneurs and
company presidents), were those who (1) scan for change opportunities, (2) set effective, change-oriented goals, (3) anticipate and prevent problems, (4) do different things, or do things differently, (5) take action, (6) persevere, and (7) achieve results. Such proactive behavior, they argued, benefits both individuals and organizations.

Crant (2000) defined proactive behavior in organizations more broadly, as “taking the initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passively adapting to present conditions” (p. 436). Key aspects of this conceptualization of proactive behavior were in terms of self-initiated behavior, designed to improve circumstances for the better, and actively challenging the status quo (Crant, 2000).

The concept of proactivity as self-initiated behavior is also reflected in the work of Michael Frese and colleagues on personal initiative. According to these researchers, the exercise of personal initiative refers to an individual taking an active and self-starting approach to work and going beyond what is formally required in a given job (Frese, Kring, Soose, & Zempel, 2015). The aspects that characterize personal initiative are as follows; behavior that is consistent with the organization’s mission has a long-term focus, is goal-directed and action-oriented, and is self-starting and proactive (Frese et al., 2015). Personal initiative is associated with self-efficacy that leads to self – starting, a condition where a person is intrinsically motivated to develop goals (individual or organizational goals) without being assigned by anybody else (Frese & Fay, 2001). Self-starters are capable of anticipating future demands and being prepared to prevent problems (Bledow & Frese, 2009). Self-starting refers to a person that is capable of doing something without being told, without specific, explicit instruction, or a detailed condition (Frese, Fay, Hilburger, 1997). Therefore personal initiative is the process of self-regulated goal setting to achieve the predetermined goals (Frese, Michael, Kring Wolfgang, Soose, Zempel, 1996; Lisbona, Palaci,
Salanova, & Frese, 2018). Personal initiative, thus conceived, may be distinguished from a proactive personality (Herrmann & Felfe, 2013; Zacher, Schmitt, Jimmieson, & Rudolph, 2018).

Parker, Williams, & Turner (2006) reiterated the view that proactive behavior involves future focus-oriented, self-initiated action, dedicated to change one’s self or the situation. In doing so, however, they argued that proactive behavior was not simply a form of extra-role behavior (i.e., behavior that goes beyond the formal requirements of a role, such as organizational citizenship behavior), but could be evidenced in both task and contextual performance. They also distinguished between two kinds of proactive work behavior, namely being proactive in the development of ideas for workplace improvement (proactive idea implementation) and being proactive in respect of addressing and solving existing workplace problems (proactive problem solving).

In a major review of proactivity at work, undertaken just over a decade ago, proactive work behavior was defined very broadly as any “anticipatory action that employees take to impact themselves and/or their environment (Grant & Ashford, 2008; p. 13). Grant & Ashford pointed out that such a definition distinguishes proactive behavior from reactive/passive behavior and more general forms of motivated behavior in several ways. First, it involves “acting in advance” (being deliberatively future-focused) and, second, its intended impact is to change something: “when employees choose to behave proactively, they are focused on the goal of meaningfully altering the self, others, or the contexts in which they are situated” (Grant & Ashford, 2008, p. 9). They also suggested that such employee proactive behaviors will vary in terms of their intended target of impact, timing, frequency and tactics used. Importantly, Grant & Ashford also articulated the growing view that proactivity at work should be considered from a process perspective, as an approach that could be applied to any task or activity at work.
Grant & Parker (2009) made a distinction between different forms of proactive behavior that can emerge in organizational settings, based on the target of that behavior. Their conceptualization of proactive behavior encapsulates being innovative and inventive, introducing new ideas to change the self and the environment:

“The first is proactive work behavior, which involves changing the internal organizational environment, such as when employees improve how work is executed by taking charge or revising tasks. The second is proactive strategic behavior, which involves changing the organization’s relationship to the external environment, such as when managers sell issues to influence the formulation and implementation of the strategy. The third is proactive person-environment fit behavior, which involves making changes to achieve greater compatibility with the organization. For example, employees engage in proactive person-environment fit behavior by seeking feedback, crafting their jobs, or negotiating *ex-post* i-deals. We identify the fourth category of proactive career behavior. Whereas the aforementioned categories focus on proactive behaviors within the context of a designated job, employees can also be proactive in their efforts to secure a job or find new jobs (e.g., career initiative) and can be proactive in their negotiations prior to accepting a job (*ex-ante* i-deals). (pp 352-353)

Bindl & Parker (2010) defined proactive behavior as “self-directed and future-focused action in an organization, in which the individual aims to bring about change, including change to the situation (e.g. introducing new work methods, influencing organizational strategy) and/or change within oneself (e.g. learning new skills to cope with future demands).” (p. 568). Similarly, Parker, Bindl & Strauss (2010) stressed the self-directed, agentic, aspirational nature of proactive work behavior:
“Being proactive is about taking control to make things happen rather than watching things happen. It involves aspiring and striving to bring about change in the environment and/or oneself to achieve a different future” (p.2)

Proactivity has also been related to feedback-seeking behavior (Ashford & Cummings, 1985; Bindl & Parker, 2010; Linderbaum & Levy, 2010), active caring in organization (Donoso, Demerouti, Garrosa Hernández, Moreno-Jiménez, & Carmona Cobo, 2015; Penner, 2002), voice behavior (Kanten & Ulker, 2012; LePine & Van Dyne, 1998; Morrison, 2011), taking initiative (Matteo Curcuruto et al., 2019), job crafting (Brenninkmeijer & Hekkert-Koning, 2015; Tims, Bakker, & Derks, 2012; van den Heuvel, Demerouti, & Peeters, 2015; Zhang & Parker, 2018) and whistleblowing behavior (Bjørkelo, Einarsen, & Matthiesen, 2010; Liu, Zhao, Jiang, & Li, 2015; Miceli & Near, 1985). Parker & Collins (2010) sought to address issues of overlap and ambiguity in how proactivity had been conceptualized and operationalized over the years. They found empirical support for three ‘higher-order’ types of proactive behavior (see Grant & Parker, 2009). Proactive work behavior (incorporating behaviors of taking charge, voice, individual innovation and problem prevention), proactive strategic behavior (strategic scanning, issue selling), and proactive person-environment fit behavior (feedback-seeking and monitoring, negotiating job change, career initiative).

Strauss & Parker (2014) have highlighted the cognitive and motivational aspects involved in proactivity at work, describing it as motivated, planned behavior that involves challenging the status quo, and seeking change:
“This conceptualization of behavior in organizations emphasizes intentionality and forethought, and acknowledges that individuals are not always merely motivated by tangible reward contingencies.” (p.2).

Most often, proactivity is perceived as positive, and having a significant beneficial impact on organizations (Bateman & Crant, 1999). However, some studies have shown that proactivity also contributed to negative outcomes at an individual level, such as psychological strain (Kersten et al., 2016; Tong, Lee, Ng, & Lee, 2017), lower ratings of overall job performance (Eatough, Way, & Chang, 2012; Hutchins, Penney, & Sublett, 2018), and job dissatisfaction (Malinauskiene, Leisyte, Romualdas, & Kirtiklyte, 2011). Recently, Parker, Wang & Liao (2019) have introduced the concept of “wise proactivity,” to reflect a more contextualized view of effective proactive behavior in organizations. Wise proactivity, they state, “involves the balanced consideration of the task and strategic context, social and relational aspects, and one’s self-regulation, when setting and striving to achieve one’s proactive goals.” (p. 237).

Given the various ways in which proactivity has been conceptualised and defined, it is reasonable to conclude that workplace proactivity is a broad behavioral construct encapsulating anticipatory, self-initiated, future-focused and change-oriented behavior in organizational settings (Crant, 2000a; Grant & Ashford, 2008; Parker, Wang, & Liao, 2019). Each of the key elements of such a definition are now discussed in more detail.

Anticipatory means that proactive individuals forecast the kinds of problems and situations that may arise should the current situation continue (De Raedt & Hooley, 2016) or the kind of improvement they can estimate for the betterment of the workplace (Wojdylo, Karlsson,
Baumann, 2016). The ability to anticipate can be derived from various aspects such as prior experiences or possessing a proactive personality (Crant & Bateman, 2000; Erdogan & Bauer, 2005). Individuals with a high level of anticipation are aroused and enthusiastic to imagine the positive impact of their behavior, and it is stipulated that affect has a significant role in driving anticipatory behavior (Luu, 2017). Although positive affect is always positively associated with anticipatory behavior, negative affect can play a major role too. Employees who are angry or unhappy with their work may be more aroused and eager to change, and already anticipate a better workplace in the future should a proper preventive, and promotive step be identified and conducted (Hirschi, Lee, Porfeli, & Vondracek, 2013; Sonnentag, Mojza, Binnewies, & Scholl, 2008).

*Self-initiated* refers to actions taken without any initiation from an external force (Lau, Wong, & Chow, 2013; Richman & Lattanner, 2014), that are internalized and intrinsically motivated (Vlachopoulos, Karageorghis, & Terry, 2000). Individuals who self-initiate typically do not rely on other people’s instruction; sometimes, they are not concerned about other people’s views or opinions, which can lead to conflict (Grant, 2012). Although self-initiated behavior is often explored from a motivational perspective, optimism has also been identified as an important factor in this aspect of proactivity (Bergheim et al., 2013). An individual that self-initiates proactive behavior must be optimistic that their actions can bring positive impacts on them and the organization (Tolentino et al., 2014). Studies indicate that proactivity is more prevalent among optimists than pessimists (Wolsink, Den Hartog, Belschak, & Oosterwijk, 2019). Optimism is important because proactivity typically requires individuals to be persistent and persevere, especially when dealing with confrontation or having to argue with people who are against the changes and ideas (Rauniomaa, Lehtonen, & Summala, 2016; Singh & Singh, 2018). Furthermore, optimists tend to have multiple adaptive coping strategies should the executed plans not go well or as expected (Bailis & Chipperfield, 2012; Snyder, Rand, & Sigmon, 2002).
Being *future-focused* involves thinking about the future (Higgins & Spiegel, 2004). The future-focused component of proactivity emphasizes the mental and the thinking ability of the individuals in planning and execution to achieve goals and objectives (Parker & Wang, 2015). Being future-focused also engages mental capabilities through the process of requiring people to recall their plans and realign their goals (Tabachnick, Miller, & Relyea, 2008). Another perspective on future-focused behavior is motivational. Future-focused individuals will envision their future self and operate in a self-regulatory mode (Miller & Brickman, 2004). Although extrinsic motivation is needed, intrinsic motivation is generally viewed as the strongest motivational component in attaining the future goal (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; Nix, Ryan, Manly, & Deci, 1999). A future-focused person is a self-system agent; they predetermine their own goal, envision the process, and are intrinsically self-motivated to achieve the goal (Chen, Farh, Campbell-Bush, Wu, & Wu, 2013).

*Change-oriented.* Change-oriented behaviors are defined as employees’ proactive acts designed to determine personal and organizational effectiveness by changing the process of doing work (Marinova, Peng, Lorinkova, Van Dyne, & Chiaburu, 2015). Change-oriented behavior is more likely if the person is dispositionally proactive (Fuller & Cox, 2010) or because leaders are constantly inspiring them to be proactive (Chen et al., 2013). Employees may seek to bring about change for personal gains such as rewards or career goals, for the benefits of their co-workers, for example, to help them to avoid hazards at the workplace, and to work as a team and to help the organization to achieve its goals (Belschak & Hartog, 2010; Wolsink et al., 2019). For a change-oriented person that is keen to improve the organization, there are certain characteristics that they possessed for them to be more proactive. Voice and whistleblowing behavior is important behaviors that proactive individuals engage in that relate to focusing on speaking up and contributing to organizational decision making (LePine & Van Dyne, 1998; Liu, Liao, & Liao, 2014). Employees
who are voicing their thoughts would give constructive ideas to innovate to improve the situation (Bjørkelo et al., 2010; Miceli & Near, 1985). Previous research has indicated that voice and whistleblowing behavior does bring positive impacts to the organizations, but it also potentially gives rise to negative consequences, especially for the employees themselves (Matteo Curcuruto & Griffin, 2018; Thomas, Whitman, & Viswesvaran, 2010).

2.3 Process perspectives on proactive work behavior

Although much of the early research into proactivity in work settings focused on proactivity as a stable individual disposition (Bateman & Crant, 1999; Crant & Bateman, 2000; Erdogan & Bauer, 2005), recent theorizing about proactive work behavior has tended to see proactive work behavior in process terms, with both individual and contextual determinants (Strauss & Parker, 2014). The development of this process perspective in theorizing about proactive behavior in work settings is described below.

Among the earliest of these process-based approaches to workplace, proactivity is that outlined by Frese & Fay (2001). Frese and colleagues have described personal initiative, a form of proactive behavior, as an action structure comprising five elements: goal development, gathering information and forecasting, plan development and implementation, monitoring the implementation, and feedback-seeking behavior (Fay & Frese, 2001; Frese, Fay, Hilburger, 1997). Once a goal is predetermined, an individual will seek information to predict future states and to construct the strategies (Bargagliotti, 2012). During the exercise of personal initiative, that behavior is observed, and individuals will then seek feedback that will be used to modify their future behavior (Bindl & Parker, 2010; Sonnentag & Spychala, 2012). According to this view, personal initiative is a continuous process of action, with a person adjusting goals according to the feedback or observation gathered in the process (Frese, Garst, & Fay, 2007).
Grant & Ashford (2008) proposed a three-phase action-oriented model of the processes involved in being proactive at work. In phase one (anticipation), employees think ahead to envision possible futures. Phase two (planning) sees employees developing plans for goal achievement in the light of those anticipated future conditions. Finally, in phase three (action directed toward plans) employees engage in concrete behaviors directed at achieving planned or envisioned goals.

Parker, Bindl & Strauss (2010) expanded on the earlier work of Frese and colleagues and Grant & Ashford (2008) to formulate a goal-directed process model of proactive work behavior that also specified the number of key motivational states that were likely to act as proximal determinants of such behavior. Specifically, they argued that:

“… proactive action is motivated, conscious, and goal-directed. Thus, to understand what prompts, stifles, and shapes proactivity, one can look to motivation theories, particularly to self-regulation theory (Bandura, 1991), which in turn draws on other theories such as goal-setting theory (Locke & Latham, 1990) and expectancy theory (Vroom, 1964). We recognize that individuals’ goals are hierarchically organised into two broad systems (Kanfer & Ackerman, 1989): Individuals anticipate desired future states or outcomes and develop strategies to reach those goals (goal generation) and then mobilize and monitor their day-to-day behaviors to attain their goals (goal striving)” (p. 4).

A central element of Parker et al.’s model involves the specification of proactive goal generation and proactive goal striving as key processes entailed in proactive work behavior. Proactive goal generation encompasses the anticipation and planning processes identified earlier by Grant & Ashford (2008), with the generation of proactive goals possible in respect of a variety of different domains (Grant & Parker, 2009; Parker & Collins, 2010). Proactive goal striving,
analogous to the third phase in Grant & Ashford’s (2008) model, incorporates “the behavioral and psychological mechanisms by which individuals purposively seek to accomplish proactive goals” (Parker et al., 2010; p.6). This entails processes of “enacting” (overt action designed to achieve a proactive goal) and “reflecting” (evaluating success, failure, and the impact of proactive goals). Each of these aspects of goal generation and goal striving are now discussed in more detail.

**Envisioning.** In the first instance, proactive goal generation requires employees to envision positive outcomes, such as improvement and innovation (Grant & Ashford, 2008). During this stage, a person will be asking ‘why’ and ‘when’ they can act to attain their goals (Mann, De Ridder, & Fujita, 2013). Individuals who are in this stage are highly influenced by autonomous motivation (Deci & Ryan, 2008). An individual who is autonomously motivated will recognize and acknowledge the reasons and benefits of the actions to themselves and other people (Healy, Ntoumanis, Veldhuijzen, & Paine, 2014). The individuals will specify a few reasons to achieve the goal, namely pursuing the objective because of the pleasure they get from it because it helps others, because of necessity or because failing to achieve the goal would threaten their self-esteem (Ehrlich & Bipp, 2016).

**Planning.** Planning is the stage where employees develop strategies to act for the proactive goal that has been predetermined during the envisioning phase (Montani, Odoardi, & Battistelli, 2014). It emphasizes self-involvement, commitment to initiate, and execute behavior (Gollwitzer & Sheeran, 2006). Individuals who aim for a better environment will make extra initiatives and create a specific plan for that (Bindl & Parker, 2010a; Odoardi, 2015; Parker & Wang, 2015). In this stage, individuals will utilize and maintain their resources (psychological resources and cognitive abilities) to produce positive ideas to improve the environment. Goal setting will encourage the development
of the best and feasible strategies in the planning stage (Locke & Latham, 1990). Proactive planning can help the individuals to maintain their attention to focus on change orientation and, given the freedom to emulate strategies through self-regulation, will increase innovative and creative tactics to prepare the individuals in overcoming obstacles and pitfalls during the process (Lau et al., 2013; Montani et al., 2014).

Another avenue to ensure the success of the planning stage is the information exchange that results from social interaction between employees (Batistič & Kenda, 2018; Grant & Parker, 2009; Riitsalu, 2017). It is hypothesized that a proactive employee is keen to share and exchange information with the co-workers (Zhang et al., 2018) for knowledge co-creation (T. Yu, de Ruyter, Patterson, & Chen, 2018) and to propose changes in work behavior (Kim, Hon, & Crant, 2009). It is also hypothesized that all the necessary strategies and information gathered in the planning process will be used as personal resources to overcome any glitches (Hutchins et al., 2018; Lau et al., 2013). Also, planning helps as a strategy to maintain perseverance and persistence should the individuals face difficult situations or challenges (Haworth & Hill, 1992; Manzi et al., 2017).

*Enacting.* Enacting is the stage where individuals begin to engage in concrete proactive actions (Grant & Parker, 2009). Unlike the envisioning and planning process, enacting is more directly observable and measurable (Lew, 2014; Parker & Wang, 2015). Enacting is a component of goal striving that reflects the set of behavior to implement all the strategies that are underlined in the planning stage (Butler & Fitzgerald, 2010). During this stage, confidence to take charge is important as the individuals must be able to demonstrate a series of actions or behavior to achieve the predetermined goals (Harvey, Blouin, & Stout, 2006; Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017).
Taking charge is defined as constructive efforts by employees to effect functional change concerning how work is executed (Morrison & Phelps 1999). It is about helping others to achieve a specific objective. Taking charge has more behavioral focus, emphasizing not only making suggestions for change but also trying to bring change about (Brosi, Spörrle, & Welpe, 2018; McAllister, Kamdar, Morrison, & Turban, 2007). Past research has indicated that employees are more likely to take charge to the extent that they have an internalized sense of responsibility for changing their workplace, believe in their capacity to perform and view top management as supportive of change efforts (Crant, 2000). Employees who are keen on taking charge are motivated by the desire for organizational improvement and not necessarily by the flawed organizational practices (Morrison, 2011).

Reflecting. Reflecting includes feedback-seeking behavior, where employees identify the consequences of post-behavioral engagement (Strauss & Parker, 2018), whether by observing outcomes or through feedback from leaders or co-workers (Parker et al., 2010). Feedback seeking behavior is an effort to determine and identify the adequacy and accuracy of demonstrated behavior, based on the predetermined goals (Ashford & Cummings, 1985). It is important to identify the gap between the pre-set objectives and the goal achievement, and any further steps taken will be molded into identifying ways for improvement (Nirig, Harris, Boswell, & Zhitao, 2011). Reflection also plays an important role in determining whether individuals can proceed, cease, or change the behavior to suit the goals, or even to change the whole objectives and restart the process (Thompson, Wolf, & Sabatine, 2012; Woodward, 1982).

Parker et al. (2010) stipulate that these four processes of proactive goal generation and goal striving (envisioning, planning, enacting, reflecting) are supported by three motivational states, namely self-confidence (Can Do), expectations (Reason To) and affect (Energized To) (Strauss, Griffin, & Parker, 2012) that are necessary and crucial for goal-oriented proactive behavior (Shin &
Each of these forms of motivation is now briefly described.

According to Parker et al. (2010), can do motivation is an amalgam of self-efficacy perceptions, control attributions, and perceptions regarding the cost of engaging in proactive behavior. They link this to self-regulation theory, in the sense that “setting a proactive goal is likely to involve a deliberative process in which the individual assesses the likely outcomes of his or her behaviors” (Parker et al., 2010 pg.8). People are more likely to pursue and persevere with proactive goals when they are confident that they can initiate those behaviors successfully, as well as deal with the likely consequences of such actions (Gist & Gist, 1987; Parker, Williams, & Turner, 2006). Can do motivation is also a function of beliefs that the chosen behaviors are likely to deliver the desired results, taking into account the person’s ability to control the context in which those behaviors occur (Frese & Fay, 2001). Finally, can-do motivation is also influenced by the perceived costs of acting in a particular way (e.g., time, energy, money, etc.). Can do proactive motivation thus reflects an individual’s confidence in their predictions regarding the future and their perceived capacity to bring about beneficial change in a given context through proactive behavior (Hirschi et al., 2013).

Reason to motivation addresses the rationale behind the choice of a proactive goal (Clarke et al., 2016). Parker et al. (2010) recognize the role played by utility judgments in motivating such behavior (e.g., as outlined within Expectancy Theory; Vroom, 1964); however, they also look to self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2000) as a framework for explaining why people choose to select and strive for proactive goals (see also Strauss & Parker, 2014). SDT specifies a continuum of various forms of motivation, ranging from intrinsic, integrated, identified, and introjected through to extrinsic motivation. Broadly speaking, intrinsic motivation refers to the motivation to engage in a behavior because that behavior is rewarding in
and of itself, whereas extrinsic motivation refers to behavior that is completely initiated and sustained by its external consequences (e.g., contingent rewards, such as remuneration, praise or punishment). The other forms of motivation, which fall on the continuum between intrinsic and extrinsic, are described as “autonomous”, in that they reflect some degree of perceived internalised individual control over the behavior. Strauss & Parker (2014) argue that, while all forms of motivation including extrinsic motivation are likely to contribute to proactive behavior, the more autonomous forms of motivation are likely to be more effective in supporting can do, reason to and energized to proactive motivational states.

‘Energized to ‘ proactive motivation is an affective state defined as “momentary, elementary feelings that combine both valence and activation” (Parker et al., 2010; pp. 838-839). High activated positive mood such as feeling energized is a strong predictor of proactive goal regulation (Bindl, Parker, Totterdell, & Hagger-Johnson, 2012). Belschak & Den Hartog (2010) also found that negative affect positively influenced proactive behavior. In some cases, negative affect such as being afraid, may activate the individuals to take charge in or to try to improve the situation (Belschak & Den Hartog, 2010; Sonnentag et al., 2008).

In addition to the goal regulation processes and proximal antecedents involved in proactive work behavior, Parker et al. (2010) also identify several more distal antecedents for proactivity at work. These include individual differences (e.g., proactive personality, openness to change and domain-relevant knowledge) and contextual variables (e.g., transformational leadership, co-worker support, and job enrichment).
One of its most important contributions of the process model of proactivity developed by Parker et al. (2010) has been their definition of a set of motivational precursors and proactive goal-regulation behaviors that could be applied to proactive behavior of any type (e.g., proactive work behavior, proactive strategic behavior, proactive person-environment fit behavior) in respect of any aspect of task performance. The central process propositions (relating to motivation and goal regulation) of the model have been the focus of limited empirical study to date, but have received some support. For example, in samples of call center agents and medical students, Bindl, Parker, Totterdell, and Hagger-Johnson (2012) found empirical support for the distinctiveness of the four aspects of proactive goal regulation (envisioning, acting, planning and reflecting), and Montani, Odoardi & Battistelli (2014) found that proactive goal generation predicted employee innovation behaviors. Hirschi, Lee, Porfeli & Vondracek (2013) were able to demonstrate links between “can do,” reason to” and energized to” forms of motivation and proactive career behaviors, while Curcuruto, Parker, and Griffin (2019) recently found that “can do” and “reason to” forms of motivation predicted safety initiative.

2.4. Conclusions

Proactive behavior in the workplace has received a considerable amount of attention from management and organizational researchers over the past two decades, and it is generally agreed that workplace proactivity encompasses self-initiated, anticipatory and future-focused actions designed to change oneself or the situation. While different forms of proactivity can be identified, based on the target of those proactive actions, it has been suggested that all forms of proactivity are underpinned by motivational states which are subsequently manifested in goal regulatory processes that involve envisioning, planning, enacting and reflecting on proactive goals (Parker et al., 2010). It is fair to say that, despite seeming widespread support within the proactivity literature, no published study to date has examined both the motivational state and goal regulation elements of
Parker et al.’s (2010) process model of proactivity. That is, no studies have yet examined the model’s proposed relationship between the specified three motivational states (can do, reason to, and energized to) and both proactive goal generation and proactive goal striving.

Recently, Parker et al. (2019) have reviewed the literature relating to individual outcomes of workplace proactivity and concluded that the evidence suggests that simply being proactive doesn’t necessarily ensure positive outcomes, either for the individual or the organization. They conclude that individual proactivity is more likely to be effective “when proactive goal generation and pursuit are appropriate to the task and strategic context, when they are considerate of others and the social context, and when the individual is effective in self-regulation” (pp. 242-243). The suggestion that being proactive might be an approach better suited to some task contexts than others has also received limited attention to date.

In the next chapter, I review the small amount of literature that exists in respect of understanding proactive behavior in a workplace safety context and conclude that applying Parker et al.’s (2010) process model of proactive behavior to this context may help improve our understanding of how workers can act to improve safety outcomes for themselves and co-workers.
Chapter 3
Proactive Safety Behavior

3.1 Introduction

As discussed in the previous chapter, there has been an increasing emphasis on the need for employees to behave proactively in the workplace. Such proactive behavior has, in turn, been linked to a range of beneficial individual outcomes, such as job performance (Bakker, Demerouti, & Xanthopoulou, 2012; Ersen & Bilgiç, 2018) innovation (Lai, Hsiao, & Hsieh, 2018; Lee, Pak, Kim, & Li, 2019), career progression (Caniëls, Semeijn, & Renders, 2018; Seibert, Kraimer, & Crant, 2001), work engagement (Ângelo & Chambel, 2014; Hakanen, Peeters, & Schaufeli, 2018), and some not so positive outcomes, such as conflict (A. M. Grant, 2013; Harvey et al., 2006; Saks, Gruman, & Cooper-Thomas, 2011), job stress (Cunningham & De La Rosa, 2008; Prashanti & Ghani, 2018) and burnout (Bergeron, Schroeder, & Martinez, 2014; Jensen, 2016).

Building on earlier work on safety citizenship behavior, several scholars have recently begun to explore the role of proactivity in a safety context (Fugas, Melia & Silva, 2011; Curcuruto & Griffin, 2016). Workplace safety is an area of increasing focus for most organizations, as they seek to reduce the risk of accidents and injury to their workers. In rapidly industrializing countries, the rising incidence of accidents and worker injury is of particular concern.

In this chapter, I review the existing research as it relates to proactive safety behavior, and suggest that understanding of such behaviors would benefit from the application of a more holistic model of proactive behavior, as outlined by Parker et al. (2010).
3.2 Safety behavior in the workplace

Workplace safety refers to the likelihood of physical harm to people, property, or the environment arising out of the performance of work activities (Beus, McCord & Zohar, 2016). While safety at work, assessed in terms of the members of injuries and deaths, has improved remarkably over the last century (Hofmann, Burke & Zohar, 2017), particularly in developed economies, the level of work-related accidents and resultant injury remains unacceptably high. For example, workplace injuries in Australia are recorded at approximately 9.3 in 1000 employees in 2016 (Safe Work Australia, 2018). Within many countries classed as developing economies, where unsafe working conditions prevail, even higher rates of worker injury and mortality prevail. For example, in 2018, the occupational accident rate is at 2.40 in 1000 workers in Malaysia (DOSH, 2018). Beus et al. (2016) have argued that accidents are an imperfect indicator of workplace safety, because “the absence of accidents in an organization with workers who disregard safety protocol does not provide evidence to suggest the presence of safety” (p. 354). That is, people can be at risk of physical harm through work, although yet to suffer harm or injury. Rather, Beus et al. (2016) suggest, the best way to predict workplace safety is by assessing safety-related work behaviors, defined as “any workplace behaviors that affect the likelihood of physical harm to persons” (p. 354).

Safety-related work behaviors (safety behavior), both at the individual and collective level, are at the core of most current theories of workplace safety and are seen as the lead indicators of the occurrence of accidents in the workplace (Beus et al., 2016). Dominant influences on safety behavior at the level of the individual worker are identified in terms of contextual factors, such as safety climate (Zohar & Hofmann, 2012; Casey, Griffin, Flatau-Harrison & Neal, 2017) and leadership (Barling, Loughlin, & Kelloway, 2002), job characteristics (Nahrgang, Morgeson, &
Hofmann, 2011), as well as individual differences arising as a consequence of personality traits, abilities, and attitudes (Beus, Dhanani, & McCord, 2015; Neal & Griffin, 2004).

Safety behavior in work settings is any behavior by a person or persons that influences the likelihood of harm to self or others (Nahrgang, Morgeson, & Hofmann, 2011) and may have positive or negative impacts, depending on the nature of that behavior (Beus, Payne, Bergman, & Arthur, 2010; McSween & Moran, 2017). It follows that safe/unsafe behavior is any behavior that reduces/increases the likelihood of such harm occurring (Nahrgang et al., 2011). Griffin & Neal (2000) identified two key forms of safety behavior: safety compliance and safety participation. Making use of the distinction between task and contextual performance (Borman & Motowidlo, 1997; Motowidlo, Borman, & Schmit, 1997), they distinguished between work-related safety behaviors that were directly related to ensuring the safety of the person performing the work (termed safety compliance behavior), and those that were likely to enhance the safety of others and the organization as a whole (safety participation behavior). Griffin & Neal (2000) posited that the primary proximal determinants of both compliance and participation are both motivational and knowledge/skill-related (see also Neal & Griffin, 2004; Casey et al., 2017).

3.2.1 Safety compliance

The bulk of research into safety behavior has focused on safety compliance behavior, which has traditionally been operationalized as the extent to which employees comply with mandated task-related safety requirements such as following safety procedures and wearing personal protective equipment (Casey et al., 2017; Ersen & Bilgiç, 2018). Compliance behaviors, in turn, are
associated with reduced accident rates in work settings (Christian, Bradley, Wallace & Bruce, 2009; Nahrgang et al., 2011).

Implicit in the term compliance is the assumption that individuals need to comply with a prescribed set of work safety norms, which includes performance of a formal set of tasks that have been identified as having an important impact on the individual and/or organization’s safety outcomes (McCoy, Roy, & Sirkman, 2013). Safety compliance, from such a perspective, is ‘in-role’ task performance in the sense that employees are obliged and expected to follow ‘prescribed’ procedures in line with the employee's job description (Gonçalves, da Silva, Lima, & Meliá, 2008). Moreover, it is the employers’ responsibility to urge and motivate the employees to comply with formal instructions and regulations (Kines et al., 2010). However, safety compliance carries the assumption that the employee's behavioral role in ensuring safety is limited and confined to adhering to existing prescribed safety policies and procedures and complying with managerial direction (Law, Dollard, Tuckey, & Dormann, 2011).

Research has indicated that the extent of safety compliance by individuals in an organization reflects the strength of that organization’s safety climate, which has be defined as “shared employee perceptions about the relative importance of safe conduct in their occupational behavior” (Zohar, 1980, p. 96). These shared perceptions, in turn, arise out of ongoing interactions that employees have with managers in an organization that inform a common view of such things as management commitment to safety, management safety practices (e.g., training), safety procedures, safety reporting, and employee involvement in safety (Beus et al., 2010).

However, it has been argued that a positive safety climate contributes to workplace safety in ways beyond simply driving compliance behavior. That is:
“a positive safety climate is more likely to encourage safety behaviors over and above basic procedural adherence due to the norm of reciprocity established when individuals and teams perceive management as placing adequate emphasis on workplace safety” (Casey et al., 2017, p. 342).

The recognition that safety behavior can be more than mere compliance has led to a significant parallel body of research into another aspect of safety performance, termed safety participation.

3.2.2 Safety participation

Safety participation has historically been viewed as a form of extra-role behavior or contextual performance. Contextual performance is defined, broadly speaking, as behavior that goes beyond that directly needed to perform job tasks (Van Scotter & Motowidlo, 1996). Drawing on the contextual performance approach, scholars have taken safety participation to refer to behaviors that are designed to help create and support a safer work context or environment, but which only indirectly enhance the safety of the engaging in those behaviors (Griffin & Neal, 2000; Casey et al., 2017; Zhang & Wu, 2014). This includes behaviors such as assisting peers and leaders to solve issues associated with occupational safety (Clissold, Buttigieg, & Cieri, 2012), volunteering in safety activities to promote workplace such as attending safety meetings, voicing out ideas or raising safety concerns to improve the workplace safety condition (Liu, Zhao, Jiang, & Li, 2015). Safety participation behaviors are less strongly associated with individual accident rates than safety compliance behaviors, reflecting the indirect nature of its impact, although it seems to be associated with the incidence of near misses (Nahrgang et al., 2011; Casey et al., 2017).
In the research literature, safety participation is frequently treated as a type of organizational citizenship behavior (Smith, Organ, & Near, 1983; Belschak & Den Hartog, 2010; Schmitt, Den Hartog, & Belschak, 2016).

“Such safety citizenship behaviors are similar to organizational citizenship behaviors except that they are focused on improving the safety performance of other team members and the organization” (Hofmann, Morgeson, & Gerras, 2003; p. 171).

Table 3.1

Safety Citizenship Role Definition and Behavior Items (Hofmann et al., 2003; p. 178)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helping</td>
<td>Volunteering for safety committees, helping teach safety procedures to new crew members, assisting others to make sure they perform their work safely, getting involved in safety activities to help my crew work more safely, helping other crew members learn about safe work practices, and helping others with safety-related responsibilities.</td>
</tr>
<tr>
<td>Voice</td>
<td>Making safety-related recommendations about work activities, speaking up and encouraging others to get involved in safety issues, expressing opinions on safety matters even if others disagree, and raising safety concerns during planning sessions.</td>
</tr>
<tr>
<td>Stewardship</td>
<td>Protecting fellow crew members from safety hazards, going</td>
</tr>
</tbody>
</table>
out of my way to look after the safety of other crew members, taking action to protect other crew members from risky situations, trying to prevent other crew members from being injured on the job, and taking action to stop safety violations in order to protect the well-being of other crew members.

| Whistleblowing | Explaining to other crew members that I will report safety violations, telling other crew members to follow safe working procedures, monitoring new crew members to ensure that they are performing safely, reporting crew members who violate safety procedures, and telling new crew members that violations of safety procedures will not be tolerated. |
| Civic Virtue (Keeping Informed) | Attending safety meetings, attending non-mandatory safety-oriented meetings, and keeping informed of changes in safety policies and procedures. |
| Initiating Safety-Related Change | Trying to improve safety procedures, trying to change the way the job is done to make it safer, trying to change policies and procedures to make them safer, and making suggestions to improve the safety of a mission. |

Safety citizenship behavior thus reflects “the degree to which employees are willing to enlarge their role beyond normal job requirements” (Casey et al., 2017; p. 342), discretionary behavior that is seen as being particularly important in safety-critical industries (Reader, Mearns, Lopes, & Kuha, 2017).
According to Hofmann, et al., (2003), safety citizenship behavior includes behaviors such as voice behavior, stewardship, helping, whistle-blowing, initiating safety-related workplace change, and civic virtue, elements that are typically assessed using the widely used Safety Citizenship Role Definition and Behavior instrument (See Table 3.1; Hofmann, et al., 2003; Laurent, Chmiel, & Hansez, 2018; Curcuruto, Conchie & Griffin, 2019). It has been suggested that such behaviors typically fall under two higher-order factors, one where the focus of the behavior is coworkers and the other where the focus is on the organization or environment: Affiliative-oriented (e.g., helping co-workers, whistleblowing) and challenging-oriented (e.g., initiating change, voice) safety behaviors (Curcuruto et al., 2019).

The principle of safety citizenship behavior is reflective of the norms of behavioral reciprocity (Hofmann, Morgeson, & Gerras, 2003). Under this purview, individuals who actively participate in such discretionary behaviors could expect the same positive behavior from co-workers and the leaders, for the mutual benefit of themselves and the organization (Hofmann et al., 2003; Zhou & Jiang, 2015).

A series of studies by Fugas and colleagues (Fugas et al., 2011; Fugas, Silva, & Meliá, 2012; Fugas et al., 2013; Fugas & Silva, 2014) has examined safety citizenship behavior through the theoretical lens of the Theory of Planned Behavior (TPB; (Ajzen, 2005). Using the term proactive safety behavior to describe the focus of their research, Fugas et al. (2011) explored the normative antecedents of safety citizenship behavior, assessed using Hofmann et al. (2003)’s Safety Citizenship Role Definition and Behavior measure. Injunctive and descriptive safety norms deriving from supervisors and co-workers were identified as potential social influences on proactive safety behavior. Descriptive norms refer to perceptions of how supervisors and co-workers participate in and comply with safety practices, while injunctive norms refer to the perceived approval of proactive and compliance safety practices. This study (Fugas et al., 2011) found that proactive
safety behavior of employees is empowered by peer approval for proactive safety behavior. However, the perception of supervisors’ safety did not affect individual safety behaviors. Employees are frequently influenced by individuals who belong to the same status and with whom they have more frequent interactions. Overall, supervisors’ and co-workers’ descriptive and injunctive norms were found to possess no relationship with safety behavior compliance.

Studies by Fugas, Silva, & Meliá (2012) examined the importance of situational factors and their influence on safety behavior. This research is referred to as proactive safety behavior; however, it used Hofmann et al., (2003) measure of Safety citizenship Role Definition and Behavior which assesses discretionary safety citizenship behavior. The findings indicated that safety climate influenced ‘proactive’ safety citizenship behavior, a relationship mediated by safety attitudes along with with the leaders and co-workers' norms regarding behavioral safety engagement.

A further study by Fugas, Silva, & Meliá (2013) highlighted the importance of co-workers’ safety behavior norms in driving safety citizenship. The findings indicated that co-workers' safety behavior would determine the employees’ safety citizenship behavior. Although previous research on leadership supports the idea that leaders play an important role in determining subordinates’ safety behavior (Chen & Chen, 2013; Eatough, Way, & Chang, 2012), the role of co-workers safety behavioral engagement acted to weaken the magnitude of the effect of the leader’s safety behavior. The co-workers' influence on other subordinates' proactive safety behavior engagement can be explained by the close-knit relationships of the employees (Ahn, Lee, & Steel, 2013; Edmunds, Ntoumanis, & Duda, 2007). Leaders are not readily available and never spend most of their working hours with the subordinates, unlike the co-workers (Nejati & Shafaei, 2018). Comparing the prediction power of co-workers’ support, leaders’ support, and perceived job control, only social support (co-workers and leaders support) significantly predicted safety citizenship behavior (Fugas & Silva, 2014).
Other research has focused on specific facets of safety citizenship behavior. One specific aspect of safety citizenship behavior that has received particular attention from researchers is safety voice. Safety voice is defined as “the act of speaking up to prevent physical harm from hazardous situations” (Noort, Reader, & Gillespie, 2019; p. 375). Safety voice can before (preventive) or after accidents happen (corrective) (Tarrant, Leslie, Bion, & Dixon-Woods, 2017). Employees may speak up to challenge the current situation on safety (Hetzner, Heid, & Gruber, 2012; Miao & Qian, 2016), to make changes in safety-related issues (Blair, 2003; Low, Man, & Chan, 2018) and/or to provide constructive ideas to improve safety (H. W. Lee, Choi, & Kim, 2018; Zohar, 2008). Safety voice is nurtured in circumstances where open and quality communication is available and exercised (Donovan, Salmon, Horberry, & Lenné, 2018), and psychological safety exists.

Although safety voices can benefit individuals and organizations in the long term, for example, to avoid incurred costs caused by accidents and injuries, being expressive and criticizing the system and practices is not always welcomed (Hussain et al., 2019; Robson et al., 2016). Studies have found that safety voice is often inhibited due to asymmetrical power relationships among organization members (Callari, Bieder, & Kirwan, 2019). An organizational hierarchy that reflects qualifications and experience is also a huge challenge to safety voice (Lee, Lu, Yang, & Chang, 2019).

Recent research by Curcuruto and colleagues has also explored specific safety citizenship behaviors in the safety context, utilizing the helping, voice, initiating change and stewardship constructs tapped by Hofmann et al. (2003)’s safety citizenship behavior measure to focus in on the more proactive aspects of safety citizenship behavior.
Curcuruto, Conchie, Mariani, & Violante (2015) examined the relationship between ‘prosocial’ and ‘proactive’ safety participation behaviors and safety performance in two chemical processing plants. Prosocial safety participation referred to those participation behaviors that are directed at assisting others in the workplace (e.g., helping coworkers to work more safely and protecting others from exposure to hazards), while proactive safety participation was seen as those that involved challenging the status quo and seeking to bring about changes in work practices. Prosocial safety participation is relational in its focus, directed at building positive social relationships and strengthening social support around safety. On the other hand, proactive participation encompasses safety participation behaviors that challenge and confront the safety system and its performance, whereby the worker is more active in voicing out concerns over unsafe working conditions and behavior, and reporting at-risk situations to prevent injuries.

Curcuruto et al. (2015) operationalized prosocial safety participation in terms of Hofman et al. (2003)’s safety citizenship subscales relating to helping and stewardship, and proactive safety participation in terms of the subscales relating to voice and initiating change. They found that prosocial safety participation behaviors were associated with fewer small accidents and less damage to property, while proactive safety participation behaviors (i.e., directed at the safety system) were associated with fewer near-miss events and lost-time injuries.

Curcuruto & Griffin (2016) reviewed the extant literature on safety proactivity, in light of an increasing concern by policymakers and regulators to ensure greater workforce participation in health and safety promotion. Drawing on the work of Parker & colleagues on proactivity (Parker, Bindl, & Strauss, 2010; Parker & Collins, 2010), they defined proactive safety behavior as “self-initiated behavior in which the employee anticipates, plans and introduces changes to achieve safety in the future” (Curcuruto & Griffin, 2016, p.3), thereby differentiating it from safety proficiency and safety performance.
Curcuruto & Griffin (2016) suggested that the various types of proactive safety behavior could be further differentiated in terms of two dimensions: protection-oriented vs. promotion-oriented and person-oriented vs. procedure-oriented. Protection is about protecting the organizations from any undesired outcomes by helping colleagues to prevent themselves from accidents, while the promotion seeks to bring the organization’s safety standard to another level. Protection-oriented behaviors might include those relating to stewardship, preventive voice, and whistleblowing. In classifying proactive safety behaviors as person-oriented vs. procedure-oriented, Curcuruto & Griffin (2016) follow the prosocial/proactive distinction made earlier by Curcuuto et al. (2015), in which person-oriented equates to behaviors designed to help and support safety-related aspects of the social system and procedure-oriented equates to behaviors that focus on bringing about improvements to the technical system. Curcuruto & Griffin (2016) also hypothesize that safety proactivity behavior can be viewed not just in terms of individual level, but also as a team and organizational level phenomenon. For example, collective mindfulness in teams might be viewed as a team-level expression of safety proactivity (Vogus & Sutcliffe, 2017), while resilience engineering approaches define processes at an organizational level that incorporates future-focused, change-oriented, reflective routines (Madni & Jackson, 2009).

Curcuruto & Griffin (2016) observe that few studies have sought to identify psychological antecedents, both distal and proximal, of proactive safety behaviors. At the contextual level, seeking to guide future theorizing and research into safety proactivity, they proposed that proactive safety behaviors are likely to be influenced by overall safety climate (e.g., managerial commitment to safety), organizational support (e.g., supervisor support, leadership styles), and job design (e.g., job autonomy, job demands). More proximally, they proposed drivers relating to an individual’s capability (e.g., role-breadth self-efficacy, locus of control), commitment (e.g., psychological ownership, personal aspirations), and future-orientation (e.g., goal-oriented motivations).
Curcuroto, Mearns & Mariani (2016) provide some empirical support for Curcuruto & Griffin (2016)’s integrated theoretical framework, in the form of a study of 523 workers from the chemical and manufacturing industries. They developed and validated a measurement instrument (PRO-SAFE) that assessed proactive safety role orientation, an overarching construct that incorporates psychological ownership, role-breadth self-efficacy, perceived control, felt responsibility, anticipation orientation, and improvement orientation. They found that general proactive safety role orientation was positively correlated with self-rated measures of safety voice and safety initiative behavior.

Curcuruto & Griffin (2018) examined the determinants of what they termed ‘change-oriented’ safety citizenship behaviors (which they equated to safety voice) and ‘affiliative-oriented’ safety citizenship behaviors (equated to stewardship behaviors). They hypothesized that organizational support for safety participation and team safety climate would influence affiliative-oriented and change-oriented safety citizenship behaviors primarily through their impact on a person’s psychological ownership for safety promotion and affective organizational commitment. The findings indicated that felt responsibility influenced voice behavior in safety and affective commitment predicted stewardship behavior. Besides, the mediation analysis also specified that affective commitment mediated the relationship between team safety climate and helping behavior. Furthermore, there was a full mediation by psychological ownership between team safety climate and voice behavior. Prosocial behavior is driven by affective commitment, a reciprocal relationship that takes place when an employee expresses support for the organization in safety-related performance (Mariani, Curcuruto, Matic, Sciacovelli, & Toderi, 2017).

Curcuroto, Parker & Griffin (2019) have extended this work, examining determinants of safety proactive behavior from a motivational perspective, and following, in part, the theoretical
frameworks outlined by Parker et al. (2010) and Bindl & Parker (2010). In particular, they focus on the initiative-taking aspect of proactive behavior. Safety initiatives refer to as anticipatory, self-initiated, and change-oriented effort to engage in safety (Curcuruto & Griffin, 2018). Specifically, Curcuruto et al. (2019) hypothesized that safety initiative behavior would be influenced by ‘Can do,’ ‘Reason to,’ and future-orientation motivational states. ‘Can do’ motivation, as was discussed in Chapter 2 of this thesis, encompasses both self-efficacy and control beliefs – can I do this and, if I do, will it deliver the desired safety outcomes? They also suggest that even if the employees have the confidence and sense of control to be proactive about safety, they must have a compelling reason to do so. Curcuruto, Parker, & Griffin (2019) point out that, for safety initiative, “an externalized “reason to” is harder to be assumed; instead the motivation likely needs to stem from within the person” (Curcuruto, et al., 2019; p. 224). Finally, reflecting Curcuruto & Griffin (2016), the study’s authors propose that future goal-orientation also acts as a motivational force driving safety initiative-taking, consistent with a goal-oriented and anticipatory path.

In this study of 300 workers in a petrochemical plant, Curcuruto et al. (2019) found that all three proactive motivation components were significant predictors of the self-reported safety initiative, measured some 18 months later. By contrast, they found that other non-proactive aspects of safety behavior (safety compliance, helping behavior) had different psychological antecedents. Safety helping was associated with affective commitment, while safety compliance behavior correlated with both affective commitment and scrupulousness (a facet of the Conscientiousness trait, as assessed by the NEO Personality Inventory; Costa & McCrae, 1992). Cururuto et al. (2019) conclude that safety initiative, a form of proactive behavior, has “distinct motivational antecedents and is uniquely associated with improvement-oriented outcomes” (p. 233).
3.3 Conclusions and future directions

From an initial focus on safety compliance behavior, it is clear that there is a growing emphasis within the safety performance literature on ways in which workers can actively participate in the creation and maintenance of workplaces that are safe for themselves and others. Whilst behaviors that involve compliance with safety policies, rules, and directives are obviously important in effective safety performance, they are generally not sufficient to achieve optimal safety performance, particularly in organizations characterized by high levels of environmental and production uncertainty (Wright & Cordery, 1991). Optimal safety performance in such settings appears more likely when workers take charge of ensuring the safety of themselves and coworkers, think ahead to what risks may arise, and exercise personal initiative in regulating their behavior and that of coworkers to achieve a safer workplace.

The concept of proactive safety behavior has emerged from the literature on safety participation, in particular, that dealing with safety citizenship behavior. Although some researchers have used the concepts of safety citizenship and proactive safety behavior interchangeably (e.g., Fugas, et al., 2011), more recent research has begun to differentiate between aspects of safety citizenship behavior to identify those aspects that are more clearly future-focused and about the exercise of personal initiative, taking charge, and bringing about change, as opposed to those that are largely grounded in the present and concerned, for example with helping and supporting others (Curcuruto & Griffin, 2016; Curcuruto et al., 2019). Recall that proactive behavior was defined in Chapter 2 as anticipatory, self-initiated, future-focused and change-oriented behavior.

This emergent literature on proactive safety behavior has recently begun to draw more directly on the general literature on proactive behavior, identifying potential psychological
antecedents of safety proactivity that differ from those that give rise to other safety behaviors, such as safety compliance and other safety participation/citizenship behaviors (e.g., stewardship, helping others; Cururuto et al., 2019), in particular, the ‘can do’ and ‘reason to’ motivational states identified by Parker, et al. (2010).

However, it is clear that there is still somewhat of a disjuncture between how proactive behavior and its antecedents and consequences have been conceptualized in the mainstream literature on proactivity, and within the literature on proactive safety behavior. For example, Cururuto et al. (2019) focus on just two of the three motivational antecedents of proactive behavior identified by Parker et al. (2010), omitting the third – ‘energized to.’ Furthermore, while there is general agreement within the proactivity literature that proactive behavior arises as a consequence of goal-directed, self-regulatory processes (Parker et al., 2010; Strauss & Parker, 2014), that takes the form of ‘Envisioning,’ ‘Planning,’ ‘Enacting,’ and ‘Reflecting’ self-regulatory behaviors, there has yet to be any research in a safety context that examine proactive safety behavior from this perspective. Rather, proactive safety behavior has usually been assessed in terms of a well-established measure of safety citizenship behavior (Hofmann et al., 2003); a measure focuses on more distal outcomes of such processes.

Furthermore, while existing research has identified organizational safety climate and social norms as influences on proactive safety behavior, research has yet to focus on either the role of human resource practices or individual differences (e.g., proactive personality) in influencing proactive safety behavior. Proactive personality is known as individual differences that operate as an antecedent to proactive behavior. In safety behavior, a proactive personality is perceived as ‘challenging,’ it can either bring a positive or negative outcome such as severing the employees’ interpersonal relationship with other colleagues (Frazier, Fainshmidt, Klinger, Pezeshkan, &
Vracheva, 2017). In short, proactive personality alone does not guarantee direct and continuous safety behavior (Sirois, Sirois, & Hirsch, 2015), it has to be supported with another contextual factor such as safety climate or individual factor such as motivation and self-efficacy (Juhász, 2010; Zheng, Qu, Ge, Sun, & Zhang, 2017). Although the relationship between personality and safety behavior is weak and insignificant (Lin, Tsai, & Chou-Kang, 2009; Toppazzini & Wiener, 2017), studies have shown that other variables such as working experience and work commitment can moderate the said relationship which in return accentuate the connection between individual differences and safety behavior (Byrne, Miller, & Pitts, 2010; J. I. Chang & Liang, 2009).

In Chapter 4, I seek to address these apparent gaps in the literature on proactive safety behavior by proposing a model of the antecedents of proactive safety behavior. This research will also focus on a self-regulatory process of proactive safety behavior that allows an individual to guide his/her thought and behavior upon achieving a pre-determined goal (Struk, Scholer, & Danckert, 2015). Furthermore, proactive behavior, as proposed by Parker et al. (2010) and Strauss & Parker (2014), is a product of three motivational mechanisms of ‘Can Do,’ ‘Reason To,’ and ‘Energized To.’ These elements will be integrated into understanding the role of motivation and other contextual predictors such as job resources (Parker, Laurie, Newton, & Jimmieson, 2014) for proactive safety behavior.
Chapter 4

Research framework and hypothesis development

4.1 Introduction

In this chapter, I outline a research framework that is derived from the preceding literature reviews, and which identifies independent variables, dependent variables, and mediating variables that will be the focus of the subsequent empirical research into proactive safety behavior. From this framework, I derive several hypotheses regarding the relationship between proactive ability, proactive motivation, proactive opportunity and proactive safety behavior that I seek to test for its applicability to young workers in a Malaysian context.

4.2 Safety behavior of young workers: The Malaysian context

Safety at work is perceived as critical, both on the international and local levels. The International Labour Organization (ILO) has identified the issue of safety at work, especially among young employees, as crucial and needing further examination and rapid improvement (ILO, 2014). The ILO, categorizes young employees into two distinct categories, (1) under 18 years old (15-18 years old) who are defined as ‘children’, but are legally allowed to do jobs and protected under a specific regulation and (2) those who are between 18-24 years old, considered as adults and covered under the labour acts (ILO, 2018). The common issues being discussed under the safety at work among young employees are the rising number of occupational injuries resulted from occupational accidents and disease. The worldwide estimation of workplace accidents is reaching over 264 million with over 350,000 fatalities occur each year (Hamalainen, Takala, & Saarela, 2006; ILO, 2006), hence, there is a huge concern over the safety and health of the young workers. About 62.5
millon young workers are engaged in hazardous work, compared to 51 million in 2004 (ILO, 2012). Based on the data provided, the number of workplace injuries is alarming and prevalent especially among the young workers from the developing countries, including Malaysia.

The definition of young Malaysian employees is similar to that adopted by the ILO. Young employees above 18 years old are governed under the Employment Act 1955, and they must be earning at least between RM 1500 to RM 5000 (The Commissioner of Law Revision Malaysia, 2012). However, these criteria are among many other eligibilities as addressed under the Act, including the provision to protect employees, e.g. children and women, while at work. However, the issues facing young Malaysian employees are not restricted to the wage or employment protection. Scholars and researchers often highlight the need for a greater emphasis on improving safety climate to protect the young Malaysian employees from workplace injuries.

Previous research into workplace accidents in Malaysia has suggested that the poor safety climate enforcement is the main factor contributing to an observed increase in occupational injuries (Adinegara, Abdul Razak, Mohammed Azman, & Nalini, 2011; Yulita, Dollard, & Idris, 2017). However, such a conclusion must be viewed cautiously. Multiple studies in other countries globally have indicated that human error is the highest contributing factor to occupational accidents (Tucker, Chmiel, Turner, Hershcovic, & Stride, 2008; S. Tucker, Diekrager, Turner, & Kelloway, 2014; Tucker & Turner, 2014, 2017). The finding is consistent with the Model of Safety Behaviour by Griffin & Neal (2000) that refutes a direct relationship between safety climate and the number of occupational accidents. The relationship is often negotiated by other organizational factors but the most prevalent and proximal predictors to the frequencies of occupational injuries are psychological factors (e.g. motivation and abilities) in safety behavior of young employees (Andrei et al., 2015; Turner, Stride, Carter, McCaughey, & Carroll, 2012).
Many studies have shown that young workers are more prone to experience work-related accidents in comparison to their older workers (Miller et al., 2007; Runyan et al., 2007; Tucker et al., 2014). Reasons forwarded for this have included the personality of young workers, for example risk-taking propensity (Westaby and Lowe, 2005), their level of physical and psychological development (Sudhinaraset & Blum, 2010) and also the working conditions young people find themselves in (Lewko et al., 2010). Studies of workplace accidents have confirmed that the frequency of workplace accidents involving youth workers is higher than for adult workers (Salminen, 2004; McCall et al., 2007; Koehoorn et al., 2009).

The Malaysian total employed population has increased to 15.1 million in 2019 compared to 8.1 million in 2000 while the proportion of the working-age population (15-64 years) increased to 68.5 percent in 2019 from 67.3 percent in 2017 (Malaysia, 2019). It is largely comprised of workers aged between 15-44 years (Nordin, 2014). In 2017, there were 40,000 reported cases of Temporary Disablement Benefit (TDB) recipients and 11,046 cases of Permanent Disablement Benefit (PBD) recorded for employees below 40 years old (SOCSO, 2017) reflecting the number of accidents experienced by young Malaysian workers. Young Malaysian workers are also involved in commuting accidents while traveling to their workplace or to other places for work (Rusli, 2014; Uehli et al., 2014).

Heightened levels of accidents and injuries among young Malaysian workers have been put down to a lack of safety training (Hooi & Hooi, 2003; Lugah et al., 2010; Ng, Health, & Hassim, 2007), scarcity of safety leadership (Bakri, Zin, Misnan, & Hakim, 2006; Ng et al., 2007), shortcomings in safety attitudes (Ghahramani & Khalkhali, 2015; Rahim, Hamid, Zulkifli, Yusuf, & Singh, 2003) and the influence of risk-taking personality (Ismail, Doostdar, & Harun, 2012; Ratnasingam, Ioras, & Abrudan, 2012; Tayaparan et al., 2018). Studies of young Malaysian workers have confirmed that key contributing factors to unsafe behavior by young Malaysian
workers are the absence of safety programmes and poor safety management procedures in organisations, resulting in limited safety knowledge (Arifin et al., 2013; Azimah, Abdullah, Spickett, & Krassi, 2009; Bahari & Clarke, 2013) and insufficient enforcement of safety behavior and standards (Ali, Abdullah, & Subramaniam, 2009; Mashi, Subramaniam, & Johari, 2018; Subramaniam, Faridahwati, Mohd Shamsudin; Md. Iazim, Ramalu, & Hassan, 2016).

While many of the published articles on young workers and safety highlight the importance of changing the behavior of workers in order to increase safety and reduce accidents, generally through external management-initiated activities that focus on safety compliance and training, none of them have looked at proactive safety behavior as a mechanism for achieving improved safety outcomes for young workers. Being proactive and innovative means a person is capable of taking responsibility for managing risk (Yuan & Woodman, 2010) especially in terms of safety behavior at the workplace. Thus, this research attempts to whether and how young workers engage in proactive safety behavior. It will look into the role of individual differences such as personality and motivation and the perceived situational antecedents such as leader and peer support.

4.3 Proactive Safety Behavior: A Research Framework

The guiding research framework for this thesis is described below and summarized in Figure 4.1. The framework seeks to identify those factors at an individual level that give rise to proactive behavior aimed at increasing safety at work. The framework draws on two main theoretical traditions: The work of Parker and colleagues on proactive motivation, as outlined in Chapter 3, and the Ability Motivation Opportunity (AMO) perspective on individual performance (Blumberg & Pringle, 1982).
Proactive safety behavior refers to employees being proactive in taking responsibility for improving safety outcomes for themselves and others. This is to be distinguished from the traditional view of employee safety behavior, which is seen as compliance with safety routines. The notion that employees should act proactively in pursuit of safety goals, rather than being compelled or directed to act, is an appealing one. Within this overall definition, proactive safety behavior is categorized in terms of two elements of self-directed goal-oriented behavior: goal generation and goal striving. Based on previous research into the nature of proactive behavior (Bindl & Parker, 2010b; Wu, Parker, & Bindl, 2013), these elements incorporate the processes of envisioning (identifying an act to improve a situation), planning (preparing or arranging a set of procedure to achieve such act), enacting (executing the plan) and reflecting (seeking feedback) on proactive safety behavior. Proactive safety behavior in this research is associated with the goal-driven process that requires an optimum level of motivational mechanism especially the internalization or innate desire for goal achievement. However, it also emphasizes the importance of other personal and environmental factors that can support one’s determination to engage in proactive safety behavior. The motivational mechanism is important in proactive safety behavior because proactivity itself is a highly motivated, goal-oriented behavior and requires the individuals to be focused and attentive in their behavior (Parker, Bindl, & Strauss, 2010).

Three principal antecedents of proactive safety behavior at the individual level are identified in my research framework: proactive ability, proactive motivation, and proactive opportunity. Ability, motivation and opportunity have long been seen as key psychological variables influencing an individual employee’s general performance at work (Blumberg & Pringle, 1986). Within human resources theory, the same three factors are seen as underpinning high performance work systems (Boxall, 2009). According to AMO theory within human resources management, those management practices that render employees more able to perform their jobs (such as through investments in recruitment and training), more motivated (such as through leadership and rewards), and with more
performance opportunities (through empowering work design), will result in higher levels of organizational or work unit performance (Hoque, Wass, Bacon, & Jones, 2018).

Figure 4.1. Proactive Safety Behavior: A Research Framework

4.4 Research hypotheses

Proactive Ability

Ability refers to skills, attitudes, personality and knowledge required to perform a job (Jiang, Lepak, Hu, & Baer, 2012). Quite frequently, ability is identified during a selection and recruitment process, whether through curriculum vitae that underlines the highest qualification and working experiences (Sterling & Boxall, 2013) or after a training and development process during
employment (van den Heuvel et al., 2015). Proactive ability is defined as the skills, attitudes, personality, and knowledge that can prepare individuals to be self-initiating, future-focused, and engaged in making changes to improve themselves, other people around them, and the environment.

For this research framework, two aspects of an individual’s ability to be proactive are identified as having the potential to predict proactive safety behavior. The first of these is proactive personality, which has consistently been found to predict proactive behavior more generally (Marler, & Hester, 2012; Grant, 2013; Parker & Wang, 2015; Bateman & Crant, 1993; Bryan et al., 2012; Grant & Ashford, 2008). Proactive personality is defined as a person’s relatively stable tendency to “scan for opportunities, show initiative, take action, and persevere until they reach closure by bringing about change” (Bateman & Crant, 1999; p. 105).

Second, the ability to be continually proactive in a safety context is likely to be a function of an individual’s locus of control. Locus of control reflects the extent of control a person perceives over potential future consequences they might experience (Brosschot, Gebhardt, & Godaert, 1994; Rotter, 1966). To the extent that locus of control influences an individual’s capacity to influence, control themselves and regulate action to change a circumstance (Blau, 1984; Levenson, 1973; Rotter, 1971), this individual difference variable is likely to affect the extent to which a person engages in proactive behavior more generally, and proactive safety behavior in particular. Studies of the relationship between locus of control, especially internal locus of control, and proactive behavior have confirmed that individuals with an internal locus of control are more able to control and manoeuvre their behavior into working towards achieving proactive safety behavior (Rotter, 1966), compared to those with an external locus of control (Wilkinson, 2007).

**H1:** Proactive ability is positively related to proactive safety behavior.
Proactive Motivation

Three distinct elements of proactive motivation are highlighted in the framework presented in Figure 4.1, reflecting the work of Bindl & Parker (2010a) and Strauss & Parker (2014). ‘Can do’ proactive motivation refers to an individual’s self-efficacy (Bandura, 1981) in respect of engaging in proactive behaviors. That is, how confident is someone that they can engage in proactive behaviors. As has already been discussed, a person’s confidence in her/his ability to be proactive is a likely determinant of proactive behavior, and the argument here is that this should also be the case for proactive safety behavior. ‘Reason to’ proactive motivation denotes the degree to which the person is able to identify compelling reasons to engage in proactive safety behavior, such as a belief that it will prevent them from being injured. Although ‘Can Do’ is hypothesized as the most significant predictor in proactive safety behavior, ‘Reason To’ will strengthen proactive safety behavior engagement if the person understands the positive impacts of proactive safety behavior on themselves and the environment in the future. Finally, ‘Energised to’ proactive motivation denotes the emotional and affective state of an individual (Bindl & Parker, 2010) in the context of a situation in which proactive safety behavior is considered. Individuals are more inclined to be part in proactive safety behavior if they are in an appropriate and optimum positive affective state, rather than in a negative affective state (Luu, 2017; van den Heuvel et al., 2015; Watson, Clark, & Tellegen, 1988).

H2: Proactive motivation is positively related to proactive safety behavior.

Proactive Opportunity

Also known as the environmental factor or work context, opportunity encompasses those aspects of a working environment that facilitate the performance of work tasks. Proactive
opportunity refers to the job resources available to support an employee to engage in proactive behavior at work (van den Heuvel et al., 2015). For this research framework, I identify three key exogenous resources that are potentially available to support a person engaging in proactive safety behavior. The first of these is social support. Social support and avenues to speak and propose new ideas are seen as necessary for improving workplace safety (Haynie, Shepherd, & McMullen, 2009). Second, opportunities for training and professional development. Employees will engage in proactive safety behavior to be more competent (Moura, Orgambídez-Ramos, & Gonçalves, 2014), to gain more benefits in the future (Thomas et al., 2010) and also a chance to contribute to organizational goals (Joo & Ready, 2012). Third, autonomy, which refers to the freedom given to the employees to accommodate them to engage in proactive safety behavior (Shin & Kim, 2014). Without job autonomy, the opportunities for employees to engage in non-standard actions, such as proactive safety behavior, are likely to be minimal.

**H3: Proactive opportunity is positively related to proactive safety behavior.**

**4.5 Conclusion**

In this chapter, I have outlined a framework designed to guide research aimed at increasing understanding of the relationship between proactive ability, proactive motivation, proactive opportunity and individual proactive safety behavior in young workers. In the chapters that follow, I will explore relationships between the key elements of the framework through a series of empirical studies.
Chapter 5

Study 1: An Exploratory Study of Proactive Safety Behavior in a Sample of Young Malaysian Workers

5.1 Introduction

In this chapter, I report the results of a qualitative study of proactive safety behavior amongst young Malaysian workers. Young workers (aged between 18-34) dominate the labor market participation in Malaysia (Koen, Asada, Nixon, Rahuman, & Arif, 2017; Malaysia, 2017), and are at heightened risk of workplace accidents (Awang, Mansor, & Rodrigo, 2015). This study was designed to explore and refine some of the key relationships specified in the model outlined in Chapter Four and to identify other factors that might affect proactive behavior amongst young Malaysian workers in a safety context. This research also aims at identifying the young workers understanding of and engagement in proactive safety behavior and also its key determining factors.

5.2 Methods

5.2.1 Research Design

To conduct this exploratory study, I adopted an ethnomethodological approach. Ethnomethodology has been described as a descriptive science of sense-making (Heap, 1976), one that enables both the researcher and the subjects to explain and create meanings of practical actions and the circumstances of those actions (Attewell, 1974). The fundamental principles of an ethnomethodological approach involve investigating and gathering *in situ* information and consequential actions based on ordinary members’ mutual understanding and concerted efforts (Garfinkel, 1996; Garfinkel & Livingston, 2003). The strength of an ethnomethodological approach
lies in the indexicality (meaning) and reflexivity (context) (Maynard & Clayman, 1991; Rawls, 2008), two symbiotic facets of a continuous cycle in ethnomethodology that provide a detailed description about an event (McNall & Johnson, 1975). Ethnomethodology has its stance in qualitative research, focusing on the interpretable social orders in a person’s daily life (Dix, Finlay, Abowd, & Beale, 2004) that eventually lead to the production of sensible knowledge that can be understood by everybody (Scheele, 1975).

5.3 Participants and Procedure

The sample consisted of 33 young Malaysian workers from a variety of industries, aged between 21 and 28 years old, and with an average working experience of 2.84 years. The inclusion criteria for the participants were that they had to be 18 to 28 years old and currently employed. Interviewees were recruited through a letter that was sent out to approximately forty Human Resources (HR) departments of Small Medium Enterprises (SME) in the Klang Valley, Kuala Lumpur, using a list of addresses that were provided by the SME Corporation Malaysia. The HR managers in those companies were then asked to forward the invitation to young employees. All of the managers agreed to do so. Furthermore, I have approached other government sectors to extend the invitation. This is to strengthen the research into understanding the proactive safety behavior among the young employees from both private and public sector. The invitation indicated that participation in the research was voluntary and that participation could be made by contacting me through mobile phone or email. A total of 15 male informants and 18 female respondents contacted me and agreed to be interviewed. Details of the respondents are presented in Table 5.1 below.
Table 5.1
The demographic information for respondents of Study 1

<table>
<thead>
<tr>
<th>Informant</th>
<th>Job tenure (years)</th>
<th>Age</th>
<th>Gender</th>
<th>Formal Education</th>
<th>Occupation</th>
<th>Industry</th>
<th>Sector</th>
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<tr>
<td>Respondent 1</td>
<td>3</td>
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<td>Male</td>
<td>Diploma</td>
<td>Retail</td>
<td>Retail</td>
<td>Private</td>
</tr>
<tr>
<td>Respondent 2</td>
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<td>Male</td>
<td>School leaver</td>
<td>Musician</td>
<td>Entertainment</td>
<td>Private</td>
</tr>
<tr>
<td>Respondent 3</td>
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<td>25</td>
<td>Male</td>
<td>Bachelor Degree</td>
<td>Salesperson</td>
<td>Hotel/Tourism</td>
<td>Government</td>
</tr>
<tr>
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<td>Male</td>
<td>Bachelor Degree</td>
<td>Trainer</td>
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<td>Public</td>
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<tr>
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<td>Lecturer</td>
<td>Education</td>
<td>Public</td>
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<tr>
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<td>Bachelor Degree</td>
<td>Teacher</td>
<td>Education</td>
<td>Public</td>
</tr>
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<td>Female</td>
<td>School Leaver</td>
<td>Supervisor</td>
<td>Business</td>
<td>Private</td>
</tr>
<tr>
<td>Respondent 8</td>
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<td>24</td>
<td>Female</td>
<td>School leaver</td>
<td>Saleswoman</td>
<td>Retail/Business</td>
<td>Private</td>
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<tr>
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<td>School Leaver</td>
<td>teacher</td>
<td>Education</td>
<td>Private</td>
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<tr>
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<td>Female</td>
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<tr>
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<td>Education</td>
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<td>Education</td>
<td>Public</td>
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<td>Entertainment</td>
<td>Private</td>
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<tr>
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<td>25</td>
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<td>Medical/Healthcare</td>
<td>government</td>
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<td>24</td>
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<td>Bachelor Degree</td>
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<td>Manufacturing</td>
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<tr>
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<td>Male</td>
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<td>Engineer</td>
<td>Mining/petroleum</td>
<td>Private</td>
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<tr>
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<td>26</td>
<td>Female</td>
<td>School leaver</td>
<td>Law Enforcer</td>
<td>Transportation</td>
<td>Agency</td>
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<td>28</td>
<td>Female</td>
<td>Bachelor Degree</td>
<td>Architect</td>
<td>Construction</td>
<td>Private</td>
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<td>26</td>
<td>Female</td>
<td>Diploma</td>
<td>Designer</td>
<td>Manufacturing</td>
<td>Private</td>
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<td>24</td>
<td>Female</td>
<td>Diploma</td>
<td>Factory operator</td>
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<td>Private</td>
</tr>
<tr>
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<td>Female</td>
<td>Diploma</td>
<td>Customs officer</td>
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<td>Government</td>
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<tr>
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<td>Medical officer</td>
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<td>Government</td>
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<td>28</td>
<td>Male</td>
<td>Aviation cert</td>
<td>Pilot</td>
<td>Transportation</td>
<td>Private</td>
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<tr>
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<td>25</td>
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<td>Law enforcer</td>
<td>Consumerism</td>
<td>Government</td>
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<tr>
<td>Respondent 26</td>
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<td>28</td>
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<td>Bachelor Degree</td>
<td>Medical officer</td>
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<td>Private</td>
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<td>Bachelor Degree</td>
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<td>News reporting</td>
<td>Private</td>
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<td>Law enforcer</td>
<td>Local authority</td>
<td>Government</td>
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<td>Higher education</td>
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<td>IT programmer</td>
<td>Telecommunication</td>
<td>Private</td>
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<td>Respondent 33</td>
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<td>23</td>
<td>Male</td>
<td>Diploma</td>
<td>Senior technician</td>
<td>Construction</td>
<td>Private</td>
</tr>
</tbody>
</table>

The Klang Valley is located in the metropolitan area of Kuala Lumpur and is recognized as having a concentration of industries with a poor safety record (Adilla et al., 2017; Ahsan, Abdullah,
Interviews were conducted face to face in various locations in the Klang Valley, from July to Sept 2015. The interviews were transcribed, translated, and then analyzed using Nvivo and Leximancer, two well-known qualitative data analysis software packages (Sotiriadou, Brouwers, & Le, 2014). I used semi-structured interviews to explore the young workers’ proactive safety behavior. The interview questions were based on the Critical Incident Technique (CIT) (Flanagan, 1954). CIT is a procedure used to gather and identify data, analyze, and to organize human behavioral patterns (Flanagan, 1954; Gremler, 2004). The CIT interview is defined as a:

“… qualitative interview procedure which facilitates the investigation of significant occurrences (events, incidents, processes, or issues) identified by the respondent, the way they are managed, and the outcomes regarding perceived effects. The objective is to gain an understanding of the incident from the perspective of the individual, taking into account cognitive, affective, and behavioral elements.” (Chell, 1998, p. 56)

The CIT interview technique is compatible with ethnomethodology research because of similarities in its fundamental principles; a procedural-based behavior scientific research method that focuses on eliciting an incident, actions, outcomes and perceived possible consequences (Dunn & Hamilton, 1986; Flanagan, Gosnell, & Fivars, 1963; Gershon et al., 2000; Norman, Redfern, Tomalin, & Oliver, 1992).
There are two ways of conducting CIT interviews: through direct observation and recalled incident data (Flanagan, 1954). There is no clear indication of limitations in direct observation (Gill & Larsson, 2015; Vianden, 2012), however, recalled incident data is proven to be more practical in terms of data collection (Dale, Sverker, & Hasselberg, 2017; Rimon, 1979). Recalled incident data or retrospective explanation offers authenticity with a detailed description (Hughes, 2007); however, it relies on the informant's cognitive abilities and memory (Weinger, Slagle, Jain, & Ordonez, 2003).

As outlined in Appendix A, seven interview questions were used to identify incidents of proactive safety behavior engagement amongst those interviewed. The questions were initially pilot-tested with five informants. To start the interview, I asked basic demographic questions such as name, age, length of service, working industry, and job title. Informants were then asked to identify incidents where they had acted proactively to prevent accidents, to describe the actions taken, and also the outcomes of their activities. The interviews, which were conducted both in English and Malay language, were recorded with a voice recorder, consented to by the informants.

Data analysis was conducted using two software packages; Nvivo and Leximancer. The focal point of this strategy of analysis is to see if there is a similarities or differences between human-oriented themes generation via NVIVO and machine oriented via Leximancer. The differences will then be elaborated. Previous studies have shown that Leximancer is an added advantage in qualitative analysis because it holds no human bias in identifying the themes (Penn-Edwards, 2010). However, the strength of NVIVO is important as it highlighted the researchers’ role in providing the feasible themes induced by his/her understanding of the whole research concept (Wilk, Soutar, & Harrigan, 2019). The integration between these two analysis can uncover more research themes and complementing the research findings (Sotiriadou et al., 2014).
The first step of the analysis was to conduct open coding through Nvivo. Next, I performed the second-order analysis and defined the membership categories based on the pre-developed theoretical research framework. In the process, I developed four additional related categories, associated with proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior. To control for potential bias in coding, I assessed inter-rater agreement for membership and findings verification. Inter-rater agreement reflects a consensual agreement between two or more inter-raters (Armstrong et al., 1997; Cook, 2012). Two Malaysians raters were appointed to assist in this process; one of them is pursuing her study at the doctoral level while the other one has a master’s degree and seven years of working experience. There were three important documents provided to the inter-raters; (1) The research project proposal (2) A research project description that explained about the informants demographic information, the interview technique, a diagram of themes composition extracted from Nvivo, and an overview of the research findings (3) Three interview transcripts (4) An inter-rater sheet. The raters were asked for an agreement on the membership categories, and to verify if the data were sufficient to answer the research objectives. Inter-Rater reliability (IRR) was calculated at .75, and Cohen’s Kappa was .62 (p<.05) indicating ‘substantial agreement’ based on Cohen’s Kappa threshold (Fleiss & Cohen, 1973; McHugh, 2012).

Next, the data were analyzed using Leximancer. Leximancer is a text analysis tool that can be used to analyze the content of collections of textual documents, to display the extracted information visually based on the spoken word and to provide the means for quantifying and displaying the conceptual structure of the text (Leximancer, 2011). Leximancer generates its codes and relationships based on the input text while Nvivo requires the analysts to iteratively design lists of concepts and codes (Angus, Rintel, & Wiles, 2013). The algorithm is self-generated and then is used to analyze the meaning within passages of text by extracting the main concepts and ideas (Harwood, Gapp, & Stewart, 2015; Tseng, Wu, Morrison, Zhang, & Chen, 2015). Leximancer is a
robust tool because it can represent a visual diagram of interconnectivity between concepts for ‘sensemaking’ (Leximancer, 2011). Previously, Leximancer has been used in workplace safety research (Broome & Gillen, 2014; Fruhen, Mearns, Flin, & Kirwan, 2014) and human resources management research (Biesenthal & Wilden, 2014; Ribiere & Walter, 2013). However, before using Leximancer for analysis, the data has to be formatted consistently. Unnecessary function words such as ‘mmmmmm’ and ‘aaaaaaa’ are considered as ill-formatted documents that can cause an error (Penn-Edwards, 2010). In a linguistics and phonetics-driven research like the anthropological research design, words like ‘mmmmmm’ and ‘aaaaaaa’ would have meanings (Nida, 1945); however, such words are irrelevant in the ethnomethodology research design (Sacks, 1974) that focus on the ‘hard information’ such as a type of action and behavior that being demonstrated and described (de Kok, 2008).

After the data cleansing process, reclustering map procedures were conducted. The main categories of proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior were examined, and additional categories treated as supplementary categories. Altogether, there were ten rounds of map reclustering during the analysis. Map reclustering is an important step to test the model consistency (Smith & Humphreys, 2006). Map reclustering is important as it can provide the most detailed themes and concepts based on the texts (Krishen, Orie Berezan, & Raab, 2019). Unlike Nvivo, Leximancer has proved to be more inherently stable, reliable and valid due to the automatic content analysis that eliminates any chances of researcher bias (Rooney, 2005; Smith & Humphreys, 2006).
5.4 Results

Membership Categorization Device Analysis (MCDA) findings from NVivo

I successfully extracted eight categories of membership using the Nvivo analysis. Four major categories were consistent with the research framework, namely, proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior. Four additional membership categories were identified, which were labeled workplace hazards, management initiatives on safety, physical injuries, and mental stress.

Proactive Ability

There was a consistency amongst respondents from the medical field, manufacturing, oil and gas industry, and aviation industries in identifying safety training as being associated with the ability to engage in proactive safety behavior. Safety training (e.g., college training and safety training) emerged as a strong catalyst for knowledge in understanding risk and preventing workplace accidents.

“"We have what we call standard operating procedures (SOP). So….this SOP is to prevent actions that can cause accidents. We have to memorize everything......we can't be careless. ” [R29].

“"Oil and gas industry... Like my company.... we have a strict safety training program. Everybody has to attend (safety training). After being appointed as staff in my company, I have attended a seven-day safety training program to learn about safety. Also, if I am selected for offshore jobs, I have to complete a BOSIET. ” [R17]

“"We have a refresher training every year......it is a requirement from the Aviation Department”. [R29].

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1 BOSIET stands for Basic Offshore Safety Induction and Emergency Training, a compulsory training program for individuals undertaking offshore tasks.
“I think my employers are providing a lot of safety training to us, and we have flight simulator and other safety training programs” [R24].

“We have mentors to remind us of safety and also continuous reminders from the safety team [R13]. They are monitoring our safety conducts....they will make sure we follow the safety procedures.” [R23].

“We have to attend all safety training provided by the company......sometimes if they discovered that we have yet to receive sufficient safety training, they would consider us as ‘unfit’ to work.” [R17].

Not all respondents were exposed to safety training or aware that it existed, however:

“My company is a small company....the income is small......a new company.....so to them....safety is not important.” [R33]

“And I’m not too sure.. I think there must be a complete safety procedure provided.” [R2]

“No. there is no safety training. And I don’t think we are aware of safety.” [R18]; and

“None. There is no safety training.” [R20].

Many of the informants who were not exposed to safety training said that their knowledge of and approach to safety was mainly built from common sense and observation.

“We have not received any formal safety training. But they told me, my practical training was a form of training, per se. Then, I make an observation. And use my common sense...to understand about safety.” [R23].

“I did not receive any formal training.....I learned from my mistakes... trial and error.” [R30].

“They only told us to be careful with sharp objects. And the rest.....we learn(about safety) while we are doing our job..”[R14].

One significant finding from the analysis was the use of media for developing safety knowledge. Independent information-seeking behavior is a practice of safety knowledge enrichment adopted by the informants. All of the research informants were born between 1980 to 1994, the generation is typically known as Generation Y (Weiler, 2005). Media exposure and gratification
have equipped them to be more likely to use media as a reference for safety information compared to the older generation. Informants believed that knowledge of safety is available online and hence accessible anytime and that this media assisted them in safety decision-making..

“I need to find (safety knowledge) myself. I need to be independent to search for something like safety training [R33], and I have to surf the internet to find the best solution (in safety).” [R18].

Informants also mentioned receiving safety knowledge from the broadcast media:

“I learned about safety from experience and awareness, from foreign TV shows like National Geographic, Discovery Channel, and also self-awareness.” [R16].

**Proactive motivation**

The findings of the qualitative analysis identified two distinct motivational mechanisms in operation in respect of choices about whether or not to act proactively in respect of safety; intrinsic and extrinsic motivation. The intrinsic motivation stemmed from an individual’s personal need for safety. For example;

“We love ourselves. We don't want anything bad to happen [R16], and For me, it's about responsibility...it's about choice.” [R21].

“Well, because of the work nature....my safety, what if I fall sick....?“ [R7].

“I did that for safety (my safety) reasons......” [R 14].

The interview also revealed that previous accidents experienced by a co-worker encouraged them to be actively engaged in proactive safety behavior for their good:

“My colleague met with an accident (workplace accident) before... After that (the accident), I am..more.. aware and cautious[ R12].

Informants who were extrinsically motivated agreed that other aspects moved them to engage in proactive safety behavior.
“Self-conscious. My daughter has a respiratory problem. Therefore, I need to take extra precaution [R27].

“Wash my hands thoroughly before I touch or come in contact with the children.” [R13].

Another informant, a secondary school teacher, thought proactive safety behavior is important not only to her but also to people around her, such as her students:

“Well, because it doesn’t only impact me but other people too.” [R16].

Respondent 2 [R2] suggested a slightly different idea when he mentioned a job opportunity. He suggested proactive behavior as a career advancement (self-improvement) mechanism, for example:

“When people (the employers) know all these things (safety boots), they will be pleased to give us a job.[R2].”

As a musician and sound engineer, Respondent 3 had to carry heavy musical instruments and facilities such as speakers and audio controller. Upon seeing the risk, he bought a pair of safety boots himself, and the safety boot symbolized autonomy. The proactive opportunity also relates to self-empowerment. Acknowledgment and the feelings of appreciated encouraged the young workers to contribute to proactive safety behavior. The informants believed that continuous safety improvement is essential not only for themselves but also to the co-workers and the organization.”

“I feel proud of......because I helped people. At least I've done my job (make changes) [R10], and For me, it’s about responsibility.....I have contributed to the workplace. I have made the office a better place to work.” [R21].
Proactive opportunity

Technology emerged as one potential constraint on the opportunity to engage in proactive safety behavior. One informant, a retail superstore team leader, indicated that most of his employees were exposed to occupational risk and injury by virtue of where they worked. According to him, those who worked at the poultry or seafood department were at significant risk of injury while performing their jobs.

“I give you an example when cutting fish or meat; we use machines. That is risky…… when we use that machine.” [R1].

In other cases, a lack of social support inhibited proactive safety behavior engagement. When an informant was asked whether talking to her supervisor helped her to improve safety at the workplace, she indicated that the action was useless:

“I don't think I will benefit from that (supervisory support). Also, other people are not doing anything.” [R12].

The availability of other work opportunities, such as employee involvement schemes, has stimulated proactive safety behavior. This encouraged informants to make positive changes to workplace safety:

“I want to do more. It makes me feel that I can change the workplace (safety). [R14]”

“I know that I can contribute something. I keep trying to make recommendations to improve (safety) because I know I can change the work system.” [R25].

Proactive safety behavior

Respondent 1, a retail superstore supervisor, explained about his task of transferring and depositing money from his office to the bank. He understood that he exposed himself to danger and
that a safety Standard Operation Procedure (SOP) for this task was not available. Therefore, he has taken a proactive measure.

“I understand that transporting a lot amount of money to the bank every day is very risky, I might probably get robbed ….so I ask a policeman at a mobile police station in front of my office to escort me to the bank” [R1].

Sometimes adverse working environment trigger actions to rectify the situation. The concern was raised due to the informant's safety awareness. R3 explained the way he attempted to initiate and take extra precautions for safety:

“Over there (the location), the installation is permanent. So we try to copy (create) cable installation which is almost the same (to the permanent cable installation); for example, the installation is called ‘Half Moon’ (Installation Technique). (This is) To cover the wire and prevent leakages, when it is placed on a rod (steel bar). We need to do our best to create that (cable installation) as secure as possible; even it is not as secure as the permanent installation.” [R3].

Incidents that happened in the past can play an important role in shaping a person’s proactive safety behavior. An informant who was previously hospitalized due to Dengue Fever had to escalate initiatives to avoid any unfortunate future events. Dengue Fever caused by Aedes Mosquitoes was one of the most considerable health problems in Malaysia. Contaminated and unkempt surroundings exacerbated it.

“I was hospitalized due to dengue fever. On that day, I felt feverish. I think I might have Dengue Fever. So I told them I need to leave because I am not feeling well........I was not the first person
affected (with Dengue Fever)......Now, I bought Shieldtox (aerosol spray to kill the mosquitoes) with my money. My boss (the manager) didn’t know about that [R18].

Another informant met an accident while performing his job and caused him to lose a part of his thumb. The incident happened after six months since he started his job.

“Yes. I experienced an accident. I was injured.. because of a machine.. that is a manual CNC machine (A machine used to cut steels and boards). The manual CNC machine is not automatic, So we need to adjust it ourselves; we have to push and pull it manually. We moved it based on three axes; X, Y, and Z axes. (It will go) Either up or down (and), we need to handle it.. or else it might be affecting (the product). The machine will make a lot of loud noise. So, when we handle the machine, we are not...our attention (lacking). Yes, I did not give much attention; I was distracted. I didn’t realize that I slightly pushed that machine, and it hit my fingers......I cut my fingers. I learned my lesson from the accidents... Since then, I will place the items on the machines and then monitor the process from afar.” [R33].

An informant who worked as a law enforcer for a government Ministry determined to write a proposal to purchase group insurance after an unusual hit and run accident, and threats that had been made with weapons such as machetes and knives. The incident happened due to a disagreement between his team and fish market retailers.

“Firstly it all started when we got splashed (with a bucket of filthy water), chased away or threatened with a chopping knife and many more, so we do not want that to happen again. We are traumatized........ To be honest, every month, I will give at least one (proposal to purchase group insurance). Or at least once in two months. It’s like whenever there’s a meeting, I will bring it up
for the suggestion. In 12 proposals, not even one was accepted. So sometimes I can’t figure out why and it’s a dead-end [R25].

However, he also mentioned that other than proposing to purchase group insurance, he came up with a strategy to avoid future risk. When my suggestion (to purchase group insurance) was never considered, I come out with a new action. For high-risk markets like, for example, in Klang Valley, if I heard any information about them (the market retailers) knowing we are coming, I will change (the operation) to another market. Or if the situation is quite hastened at the market, we will focus on monitoring the supermarkets. Because, if there’s a problem or incidents that happened at the supermarket, we will complain straight to their headquarters. So the risk is slightly lower. I instructed my colleagues who are pregnant, to stay at the office for data entry and clerical works. That was some drastic action that I took on my own.” [R25].

An electrical short circuit is a condition that can cause future loss, such as fire or even lost lives. One informant, a secondary school teacher, described proactive behavior that she had engaged in to prevent accidents due to electrical faults:

There’s one instance when a plug is switched on, causing a short circuit. It is in the examination room. It’s only a short circuit, not to the extent of unattended exposed cables. Ok, in that particular room, there’s this main switchboard. I went to the board and switched it on repeatedly. I recognized the faulty plug or switch so that the particular plug will not be used until repaired. I went and told the person in charge of the room about the problem, and that person informed the Deputy Director who will then instructed the school’s technician to check on which part that caused the short circuit before repairing it. If it involves faulty appliances, then it will be replaced……. Oh, one major thing that has happened in my school is that the library has been on fire once. It was not during school days, and it was at 5 am. A short circuit happened in an audio-visual room. It exploded and started a fire……It happened because of the school condition….old buildings.” [R6].
An informant also revealed that although he could see serious safety issues at his workplace and took some action to bring this to the attention of management, he carried on with work as usual:

“There is one incident at the camp. The camp was built in the year 2000. .. but there are some soil movements. Up to this point, we received no eviction notice. I know that this can cause problems...I’ve talked to the manager of this camp about the condition. However, we continue (to work) as usual...., although we can see some serious soil movement.” [R5].

Another informant, a public institution employee, described her initiative in responding to a hazardous condition at her workplace.

“Open ceiling or maybe incomplete (construction) works. It was the contractor, he came to fix something, but once (the job) completed, he left the ceiling wide open. When I saw the gap between the ceiling....I made a complaint through the system... The university system... A person in charge will respond to us within a few working days. However, the response was quite prompt. The contractor came and fixed the ceiling within three hours. I think it also has something to do with audits. And we have audits....every year. Whenever they see that (irregularities)...they will give us a warning... We can be reprimanded with OFI, NCR (Auditing Standard).” [R30].

Workplace hazards

Workplace hazards are defined as any source of potential damage, harm, or adverse health effects on something or someone under certain conditions at work (Mitolo & Montazemi, 2014) physically or mentally. I have organized the data according to six types of workplace hazards that can be identified; safety hazards, work organization hazards, physical hazards, ergonomic hazards, chemical hazards, and biological hazards (www.osha.gov/dte/grant_materials/fy10/sh-20839-10/circle_chart.pdf).

Safety hazards. Safety hazards are a common hazard that occurs in the workplace such as electrical hazards (short circuits), working from heights, tripping hazards, and machinery-related hazards
(Matern & Koneczny, 2007). The most prevalent safety hazards reported by the informants were electrical short circuits.

In the first few months after I started working here......there are a few cases of short circuit.......i think was due to usage overload [R31]

“The computer had to be switched on all the time....it is normal considering our work nature (computer programmer)....but....it can cause electrical short circuit too.....usage overload....[R32]”.

**Work organization hazards.** Work organization hazards are hazards or stressors that cause stress, such as workload, lack of respect, or lack of control (Jeffrey Hillgert, 2013). Some of the informants were exposed to verbal and non-verbal harassment from other employees or clients. Respondent 20 [R20], a law enforcer was suffering from verbal harassment and sexual harassment by her clients, for example;

*They uttered verbal threats to me. He said something like.....he can do something to me......(speak) loudly.....in public....he is not happy with it (the summon)...[R20] and I was sexually harassed........by a truck driver......I think he was drunk.....he showed me his private part. I was shocked..... [R20].*

According to Respondent 20, there was no preventive measure taken by her employer despite the rising number of cases involving sexual harassment towards female law enforcers. The only preventive measure they have taken was to write a report in a logbook as future references, should the situation worsen.

Drug abuse is another form of work organization hazard that I have identified from the interviews. Respondent 2 mentioned that, as a musician and sound engineer, he is at-risk of becoming a drug addict. Some musicians got involved in drug abuse due to peer pressure, while others used cannabis for endurance.

*The risk is to become a drug addict. Because most of the people in this industry are using drugs, it’s like a lifestyle...For me, it isn’t a big issue. Sometimes we didn’t know that they (the co-workers) are high (on drugs). So we asked them (to do some task), they are (the reaction) is just too slow. We
got mad at them, and we felt tense. Why did they refuse to work? Oh.. it turned out that they were high (on drugs). So then we understand. Oh.. it takes time (for them to recover) about half an hour, and then they will be okay. But they are risking their lives when they take it (cannabis). [R2]

**Physical hazards.** Physical hazards are factors within the environment that can harm the body without necessarily touching it (McSween & Moran, 2017). Respondent 28 [R28], an informant from a manufacturing company, mentioned radiation. Her job was to test the electromagnetic effect on a product. For that procedure, she was required to monitor the electromagnetic effect in a radiation room. She expressed concern for her safety and tried to minimize contacts with that room: ‘The problem with the radiation room is like this. My department is located very close to the radiation room. Limited spaces. They can’t build the radiation room elsewhere. Although the room is locked and closed most of the time, there are chances of radiation leakage. But we can not do anything. As much as we can, we will try to maximize safety precautions. And pregnant women are not allowed to be stationed in our department. I will not go near to that room if I don’t have to [R28].

**Chemical hazards.** Respondent 17 [R17] is an informant from heavy industry (cement). His daily job involved working with chemical solutions like kiln (a type of solvent). He did mention about having breathing difficulty during the first few months of his employment. On top of that, he also experienced eye irritation due to the dusty working environment. However, according to him, to overcome these health issues, his company provided annual medical check-up and other medical benefits which are sufficient and necessary.

*I have to deal with dust, vapor, and fumes from the kiln (solvent). It was difficult in the beginning. I can say that my health condition was pretty bad. I was not comfortable....and adjusting to the environment.....but since the company provided medical benefits, I think it is quite okay.....but I don’t think I want to work here forever.......I am concern (of my medical condition). [R17]

**Biological hazards.** Biological hazards are not a constraint to infection through blood and other body fluids but also from insect and wild animals (Walton & Rogers, 2017). In an interview with
one academic staff, he agreed that biological hazards might cause by monkeys and wild boars. Respondent 4 [R4] for example, agreed that the rapid development around his workplace had exacerbated this condition. The animals are losing their natural habitat.; wildlife began to terrorize human space for food.

There are monkeys, wild boars....these animals are everywhere......they came to our workplace in the evening...they are looking for food. Sometimes they attacked us.....I am afraid if they have like......you know....maybe like in the Outbreak movie...who knows they are infected by something......[R4]

**Ergonomic hazards.** Ergonomic hazards occur when the type of work, body positions, and working conditions put a strain on the body (Shockey, Luckhaupt, Groenewold, & Lu, 2018). Three of the informants mentioned about their working experience and ergonomic hazards. Two of the informants (R3, R16) are working in the music industry. R3 and R16 commented about having to endure back pain caused by moving heavy things to places.

*I had to carry the speaker......because this is a small company....so we cannot hire the Bangladeshi workers. I was hospitalized due to back pain and slip disc. I cannot carry heavy loads anymore..... [R3], and When I was working as a sound engineer, I had to carry heavy loads. It is normal. Everybody has to do it. But now...I begin to feel the impact...I constantly experienced back pain. I think because of the heavy loads [R16].*

Respondent 1, on the other hand, had to carry heavy carpets;

*During the Eid festival, I had to carry bundles of ‘songket’ materials from ‘Utama Complex’ to ‘Medan Mara.’ I didn’t think so much. My concern is I have to send the materials to my clients. I had to walk about 500metres and used the escalator instead of the elevator. Since then, my arms feel......sometimes very sore... [R1].*

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2 Songket is a type of heavy fabric that people normally used to make traditional costumes.
Management initiatives on safety

Through the interviews, informants commented on their perception of safety efforts made by employers.

**Personal protective initiatives.** Personal Protective Equipment (PPE) is mandatory training and equipment (John, Tomas, Hari, Wilson, & Donskey, 2017) provided by the employers to protect the wearers from occupational injuries and accidents (Villano, Follo, Chappell, & Collins, 2017). Although the employers are responsible for providing and monitoring the usage of PPE (Afrifa, Essien-Baidoo, Ephraim, Nkrumah, & Dankyira, 2017; Carballo-Leyeda, Villa, López-Satué, & Rodríguez-Marroyo, 2017), however, the findings revealed otherwise. From the interview, it can be determined that the protective equipment owned by the informants were their protective initiatives and not PPE. The informants who employed by small and medium-sized companies purchased the equipment they presumed as PPE for protection. Quite often, the equipment was at the lowest quality and the most basic protection but affordable. The musicians (R2 and R16) bought a pair of safety boots to cover their feet while working with heavy musical instruments;

*I bought a pair of safety boots, just a normal (ordinary) one....not expensive....enough to work with....and the only (pair of boots) that I can afford (to buy) with my salary [R2].*

*Yes, I buy (the safety boot) myself [R16].*

Respondent 14 [R14] who had to do outdoor jobs were a concern of the amount of heat he had to endure every day. Therefore, he bought a farmer’s hat.

*It is so hot.......so I bought a gardener’s hat. The hat that farmers usually wear [R14].*

Other examples of personal protective initiatives demonstrated by the employees were mentioned by Respondent 26 [R26]. Working as a law enforcer and having to deal with civilians, this law enforcer is aware of the risk that may cause occupational accidents. Hence, as law enforcer
who is not to entitle to carry weapons while performing their jobs, one of the easiest ways to protect themselves is by learning martial arts;

*I learned ‘Silat’ to protect myself.....some people won’t be happy with the parking ticket or summon. If I was threatened or attacked, at least I can protect myself [R26].*

**Physical injuries**

Some informants have experienced physical injuries while doing their jobs. Respondent 4 (R4) had ten banquet chairs fell on top of him when he was preparing the banquet room for a function:

*I was wounded because ten banquet chairs fell on top of me. We were told what to do (about the job) but not safety.*

Respondent 3 (R3) also experienced scratches and wounds when a speaker fell on his toes:

“So after it (the speaker) fell, I hold the speaker with my hand to stop it from falling further down..........that caused scratches and injuries.

Respondent 33 (R33) also had his finger cut while operating a machine.

*I am very young, just started working...........no gloves on.......I didn’t realize anything until the machine cut a small portion of my finger.” [R33].

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3 Silat is a form of martial arts, predominantly taught and learned by Malay community.
Mental stress

In this category, mental stress is explained by looking at two aspects; the type of stress and the coping process. Overall, most of the informants did experience manageable stress caused by workloads.

*(Heavy) Workload... maybe... Honestly speaking, I think all we will have this problem... work stress, maybe, as long as we are in the academic field* [R4].

Physiological strain, such as a headache was also experienced by an informant whenever she had to work based on targets.

*Especially when I need to achieve the target. I will suffer from dizziness and migraine (because of stress)* [R9].

The informants revealed that social support is one of the most common coping strategies for overcoming mental stress. Respondent 5 [R5] agreed that talking to a close family member helped her to overcome stress.

*I talk to my husband or my family* [R5].

A medical officer mentioned that having access to mentoring and coaching program helped her to manage work stress.

*We will share our problems with our mentor. We also have a coach...a specialist.....its like coaching. We learn a lot of things through this coaching and mentoring* [R27].

Professional help like counseling and therapy program was provided by the airline company to assist with mental support;

*Normally they (the company) will call the doctor to the office for therapy* [R29].

However, stress can also occur due to inadequate workloads:

*(I will be under a lot of stress) when I have so many things to do.......or when I have nothing else to do* [R2].

The above informant mentioned that this happened because of his passion in his job.
Findings from the Leximancer analysis

I used Leximancer to investigate the relationship between the categories identified by Nvivo. Leximancer is a tool for analysis that provides a visual relationship between categories (Ward et al., 2014), and is capable of extracting meaning consensus among the informants (Penn-Edwards, 2010).

There were eight main categories derived from the Leximancer output; Proactive safety behavior (100%), proactive opportunity (93%), proactive motivation (60%), proactive ability (43%), mental stress (27%), management initiatives on safety (18%) and physical injuries (11%). These are depicted in Figure 5.2.

The percentages from Leximancer are reflecting the relative importance of the categories derived from the research findings (Angus et al., 2013; Smith & Humphreys, 2006) The hot colors (red, orange, yellow) in Figure 5.2 denote the most important category, and cool colors (blue, green, purple) denote the least important themes (Sotiriadou et al., 2014). The main idea of the category is elaborated based on the variability of the concept (Tseng et al., 2015). Visually, the map is representing a connection and association between the whole categories and concepts and explaining the structure and meaning of the data (Cretchley, Rooney, & Gallois, 2010). The meanings in Leximancer analysis are constructed through the frequency of word utterances (Smith & Humphreys, 2006). An initial interpretation of Fig 5.2 reflects the entire set of components of the theoretical model (e.g., proactive safety behavior, proactive ability, proactive motivation, and proactive opportunity) as what being described in Figure 1 in Chapter 1.
As depicted in Figure 5.2, the most important category with the highest percentage of relevancy to the data is proactive safety behavior, shown in red. Categories associated with proactive safety behavior that emerged from Leximancer analysis represented some similarities with the Nvivo Membership Categorization Device Analysis categories.

The interpretation of Leximancer visual map must be made according to the protocols being underlined such as the colors, the size of the circles, the position of the circles, the number of concepts within each circle and also the meaning of concepts located outside of the circles. As being mentioned earlier, the categories in the hot color denoted as the most relevant to the research data. However, the size of circles carries no meaning about the data (Wilk et al., 2019), but the data
The prevalence is identified based on the concepts within the circles. The concepts in the category (circle) reflects the frequencies of words uttered during the interview (Dadich & Jarrett, 2019). Therefore, making it feasible to establish that most of the informants shared the same meanings constituting the category (Chiu & Tseng, 2018).

The position of the circle also signifies some most important information about the research findings. The central category of this research is proactive safety behavior, and the second most relevant category is a proactive opportunity. However, the proactive opportunity is positioned slightly further up and connected to proactive safety behavior through proactive ability. It simply means that a relational connection between proactive safety behavior and proactive opportunity is not too significant (Chiu, Bae, & Won, 2017). Proactive opportunity in this research is associated with the psychological and social support provided at the workplace, as explained in Chapter Four. Therefore, it is important to note here that based on the interview finding, the proactive opportunity is not an important predictor of proactive safety behavior. Another important information to note two categories are connected to proactive opportunity but distant from proactive safety behavior; mental stress and physical injuries. As being stated earlier, the proactive opportunity is about psycho-social support, thus confirming that psycho-social support is an important factor to either increase or decrease mental stress and physical injuries, e.g., support from the co-workers can help buffer the mental stress that may also lead to reducing any risk lead to physical injuries.

There are two concepts located outside of the categories; ‘handle’ and ‘management.’ Based on the previous research that used Leximancer for analysis, such concepts are associated with ‘major concepts’ that dominated the categories (see Hyndman & Pill, 2018). For example, ‘management’ is located outside to the ‘management initiative for safety’ category, while ‘handle’ is positioned outside the proactive motivation category. However, ‘handle’ is connected to proactive motivation via ‘management.’ Based on the research findings, it is crucial to mention here that the
young workers perceived that the management is the most important party that can mitigate risks at the workplace, for example,

But the management does not provide a proper space.... [R20]

"...and can’t handle two works at a time. But here, we have to handle everything [R3].

Both phrases are referring to how the management failed to address crucial issues such as to provide a proper space to do work that can expose the employees to risk. Besides, ‘handle’ carried a meaning that the management has failed to accommodate or manage issues such as workplace hazards. Therefore, the young workers have to come out with their initiatives to prevent injuries for the benefit of themselves and their co-workers. Therefore, it is safe to argue here that management is an important concept that determines not only workplace safety but also proactive motivation.

One distinct finding that can be detected when comparing Nvivo and Leximancer analysis is the ‘Workplace Hazards’ category. ‘Workplace hazards’ were represented through Nvivo Membership Categorization Device Analysis. However, it was not identified through Leximancer analysis. After a closer look at the categories, ‘Workplace hazards’ were grouped in ‘Management initiatives on safety’ and proactive safety behavior. ‘Working experience’ emerged through Leximancer analysis and was associated with proactive ability and proactive opportunity. Proactive ability was connected to ‘Working experience,’ ‘Proactive Opportunity,’ ‘Proactive Motivation’ and ‘Proactive Safety Behavior’ . ‘Co-workers’ appeared as a sub-category of Proactive Safety Behavior shared by ‘Proactive Ability,’ ‘Proactive Motivation’ and ‘Proactive Safety Behavior’ . Other than that, 'Co-workers’ is also a sub-category of Proactive Motivation, and shared with ‘Physical injuries.’ There was a connection between ‘Mental stress’ and ‘Physical injuries.’ ‘Self’ appeared as a subcategory to ‘Proactive Motivation ‘and ‘Proactive Safety Behavior.’ ‘Management’ is identified as a subcategory of ‘Management initiatives on safety’ and ‘Proactive Motivation.’
Referring to Figure 5.1, ‘care’ is a sub-category for ‘Management initiatives on safety.’ Delving into the data, ‘care’ is a word extracted from ‘do not care’ or ‘does not care’ or ‘did not care,’ referring to the management initiatives on safety, for example; ‘But he doesn’t care. He did not take any initiative (in safety) [R18].’ ‘Fire’ is a subcategory developed by an agreement between the informants. Most of them mentioned about ‘fire’ referring to fire safety training as the most common management initiative on safety;

*There were firemen who came to our office. Maybe twice. He told us about what to do during a fire. Fire exits. And the assembly area [R31].*

*We have a fire extinguisher.... if there’s a fire, the most important thing is how to alert other people [R4].*

‘Management’ is connected to ‘Do’ in proactive motivation. This can be seen from an interview with Respondent 14.

*(They) The management does not do anything........We love ourselves. We don't want anything bad to happen. If anything happens... I don’t think the insurance will cover us...... Also, to avoid injuries........ So we take the precaution measures. [R14].*

This statement reflects the informant’s view that the lack of initiative demonstrated by the management has motivated him to be more concerned for his safety. On another note, an informant has indicated that the absence of management initiatives in providing a safe workplace is her motivation to engage in Proactive Safety Behavior. R21, a factory operator, was concerned about a physical attack from the public. She persuaded the management to provide a parking space closer to the office. The management rejected her request, instead, advised her to be extra careful. Therefore, for safety reason, she seeks help from a policeman:

*I will ask the police to escort me to my car. The police are my friend. I asked for his favor......[R21].*

The proactive safety behavior category hosted many sub-categories, such as ‘wear,’” safety,’ ‘risk,’ ’machine’ and ‘training’ which associated with safety training and Personal Protective
Equipment (PPE). ‘Co-workers,’ ‘learn,’ and ‘know’ subcategories were shared with the proactive motivation category, explained about how knowledge of safety motivated the informant in proactive safety behavior engagement. In proactive safety behavior, the co-workers' concept is identified through responses from R4:

My friend told me about safety....my co-worker, Dr. Nazmi....he, is a safety officer appointed by the management [R4].

According to R4, his co-worker will keep them updated on the current organizational safety performance. Respondent 33 [R33] mentioned about his perception towards his co-worker’s perilous acts. His co-worker refused to wear PPE as instructed by the management. However, his self-motivation and awareness prevented him from imitating such behavior;

Oh, yes, there was. There are people (co-workers). They didn’t want to wear PPE. They were informed (to wear), but they refused to. Really...that is their problem [R33].

‘Risk,’ a sub-category in proactive safety behavior category, expressed how a perceived risk determined proactive safety behavior undertaking. For example,

The department with the highest risk is the Fresh Department because they have machines to cut vegetables, fish .......we have our SOP.....training. Also, it (the procedures) will be explained during the morning briefing [R1].

One of the informants when asked about his reaction towards risk, agreed that he would be more proactive;

I act proactively; I make sure I follow the rules [R11].

In Leximancer, workplace hazards were not identified as one separate category. Instead, it is explained through the ‘risk’ subcategory. Respondent 21 identified her working environment as unsafe due to the possibilities of sexual harassment by foreign workers.
Sexual harassment. This is the risk. Therefore, I will not go (to the factory) alone. I would ask (a friend) to accompany. Usually, I will bring my telephone because, at least in case of an emergency, we can call someone. We cannot bring any weapons into the factory [R21].

In the proactive safety behavior category, the subcategory of ‘wear’ and ‘safety’ is linked to PPE. The informants understood the importance of PPE for safety, however, often realized that PPE was not readily available and accessible to them for their safety;

Sometimes when there are no gloves. Or we are not wearing any gloves; our fingers might get hurt. Pinched in between (boxes), especially when we have to load and unload heavy boxes. But the problem is. Even if we put the gloves on, our fingers might still get hurt. Because the glove is made of soft fabric or material, not iron and not heat resistant [R3].

A majority of the informants agreed that insurance is another form of Proactive Ability in proactive safety behavior engagement. It signified their shared belief of having personal insurance as an important aspect of proactive safety behavior;

I think we need to have personal insurance. Just in case [R10] and Yes, I have personal insurance. I purchased it myself [R19].

‘Company,’ another sub-category of proactive ability, described the role of companies or organizations in providing adequate safety training. Respondent 33 talked about the importance of Green Card accreditation.

CIDB (a safety accreditation body) accreditation is the most important thing. Because I will get the green card, right? Those who work at the construction site they need to have it. So I think the company must help us to get that (safety training and the Green Card) [R33].
Green Card is a specific endorsement that verifies one’s capability or fit-to-work for individuals working in the construction industry. It will be granted once they have completed a designated training program.

The proactive opportunity was found to be the most relevant category to the data after proactive safety behavior, and it is related to another category; ‘Working experience.’ ‘Working experience’ has one subcategory; ‘Empowerment.’ The connection between these categories is indicated in responses from Respondent 28. Respondent 28 [R28] who has three years of working experience does not hesitate to talk to her manager about upgrading the machines to avoid any work hazard:

*I talked to my boss about the machines. Since an accident happened (a screw is uprooted and blew) I do not want the same thing to happen in the future.*

Another example of the relationship between working experience and Proactive Opportunity can be identified from R6. With five years of working experience, she demanded the school to repair the roof, which is in a very critical condition:

*I knew that the school would get a certain allocation for refurbishment. But each time when I asked them to repair the roof, they told me there is no allocation (financial allocation). But I knew they used that (financial allocation) to support other things such as the school activities.*

R32 mentioned feeling contented and comfortable having to work in a safe working environment. He said

*I feel stress whenever I have to work under a hazardous working condition. No mood to work......But when I managed to make some changes......like to make something and make the office a better place to work in......I feel happy.*
The subcategories of Proactive Opportunity are ‘Office,’ ‘Place’, and ‘Working’ conceded as an important category in proactive safety behavior. It represented how organizational support or workplace support empowered the informants to engage in proactive safety behavior.

*When the company is a concern for our needs, we feel happy. Safety is very important. That’s why we would like to stay and work with them. We will be more active (to practice safety behavior) [R14].*

In the ‘mental stress’ theme, there were responses regarding stress coping mechanisms. R21 and R27 explained the importance of counseling services at work. They perceived counseling services as an avenue to deal with and manage work stress. ‘Tell,’ ‘Problems’ and ‘Handle’ reflected how talking to someone might help them to recover from work stress. Another subcategory, ‘Handle’ is connected to ‘Management,’ which implicitly communicated by the informants the importance of counseling services or Employee Assisting Program (EAP) for the employees;

*It is important.....when we get depressed, we must know how to let it out....... we need to have somebody to listen to our problems [R27].*

‘Co-workers’ is a subcategory of ‘Physical injuries’ and explains how the young workers witnessed safety violations by the co-workers. However, many of them identified these conducts as risky and prevented themselves from following such behavior.

*“Sometimes...I have a co-worker who did not wear any safety boots, safety helmets, and gloves. He is quite old. Maybe he is an expert.” [R14].*

However, R14 did not follow or replicate such behavior for his safety. The relationship between mental stress and physical injuries can be identified from the interviews. This can be identified by scrutinizing responses from R1:

*“All unloading jobs need to be done the night before. We will never let them do the unloading jobs in the morning before the operation. If they are tired.......they can’t focus....when they can’t focus.....they might get hurt. “ [R1]
5.5 Discussion

The overarching objective of Study 1 was to explore proactive safety behavior among young Malaysian workers. This includes identifying the functioning roles of ability, motivation, and opportunity as they impact on proactive safety behavior. Also, it attempted to describe the shared meanings of proactive safety behavior among young Malaysian workers.

Both the Nvivo Membership Categorization Device Analysis and Leximancer analyses identified four pertinent categories related to the focus of this thesis; proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior. However, there were some clear points of difference. For example, ‘Workplace Hazards,’ a category that I identified from the interview transcripts using NVivo, was not constructed as a category in Leximancer. As explained earlier, Leximancer analysis has its focal point on shared beliefs between the informants based on the interview transcripts. Hence, ‘Workplace Hazards’ was not perceived as relevant to all of the informants. However, the ‘risk’ that emerged in the proactive safety behavior category was indirectly related to workplace hazards, which is perceived as a mechanism or stimulus for Proactive Safety Behavior.

In Chapter 2 and Chapter 3, I have discussed that proactive safety behavior is mostly internalized, and is a ‘self-system,’ meaning that it must be intrinsically motivated and being initiated by the individuals. During the interview, the informants have mentioned many times, words consisting of ‘self.’ It is quite apparent that the proactive safety behavior engagement process is operating from the self-system. For example, the informants are relying on themselves to take charge of determining actions and behavior to prevent themselves from injuries. The word ‘self’ appeared in two categories; in the proactive motivation category and proactive safety behavior
category. Therefore, affirming that self-system is an important mechanism in proactive safety behavior. For example,

“………………and before the specimen was extracted, I will wear the mask to protect myself” [R13].

“No. I just take care of myself” [R19].

‘Management’ emerged in the Leximancer analysis as category and subcategories but not as a distinct category in Nvivo Membership Categorization Device Analysis. However, ‘management initiatives on safety’ were identified in the Nvivo findings. Based on the Leximancer analysis, the informants agreed on the ‘Management’ role in helping the employees to engage in proactive safety behavior. It also associated with managerial failure to provide the necessary infrastructure and information for the employees’ safety. The emergence of ‘management’ as a concept in Leximancer analysis and also Membership Categorization Device Analysis delivered a significant meaning about proactive safety behavior among the young workers. Looking at both findings from Nvivo and Leximancer, it is an ostensible and robust justification that the young workers are criticizing the managerial or the company's role in providing a safe workplace. In addition to that important finding, the informants are confirming that such irresponsible acts have motivated them to engage in proactive safety behavior particularly for their sustainability and future;

“People in my company like the manager didn’t teach me, so I have to learn it myself” [R28].

“I made a recommendation…. to use a device…..for safety.....But I don’t think they (the management) are financially equipped to buy and provide the device” [R26].

To develop and sustain a safe working environment is not an easy task. It requires a coordinated effort from the employers and the employees. However, in cases where the employers are unacquainted with safety importance, employees often initiate or take charge of their safety. Occasionally, employers who failed to provide a safe working environment are those who are struggling with financial stability. Small and medium-sized industries often neglected the
importance of safety primarily because they are not able to see the cost-benefit effect. Most small-medium sized industries have short-term business planning, often relying on government funds to operate. The allocation is limited and sufficient to support the business operation without extra funding for the training and development program. The Malaysian Government is concerned about this situation. Hence the government-provided safety training scheme under the Human Resources Development Fund (HRDF). Despite this initiative, the number of workplace accidents keeps rising (SOCSO, 2013).

The findings of this research have provided some useful insights that can be elaborated based on the research framework, as explained at the beginning of this chapter. The research framework focuses on four important determinants, namely proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior as the output. However, the findings also provided other relevant complementing concepts that are associated with the determinants and the output.

It is feasible to mention here that the findings are supporting the proposed research framework based on the emerging themes and concepts of Leximancer analysis. The closest determinant to proactive safety behavior is proactive motivation. Although proactive motivation is denoted in cool color (green), which translated as less important, however, the theme is proximal to Proactive Safety Behavior. The closer the theme to each other in the display output, the higher the connectedness between them (Sotiriadou et al., 2014).

Furthermore, proactive motivation is deemed as important because the number of concepts is reflecting its relevance to the findings (Smith & Humphreys, 2006). There are seven concepts in proactive motivation, recorded as having the highest number of concepts as compared to other determinants of proactive safety behavior. Proactive ability, also among the closest to proactive
safety behavior, signifying its connectedness. However, it has the least concepts in the theme. On the other hand, the proactive opportunity is in hot color (orange), displayed as important, but located a bit further up in the displayed outcome. Therefore, it means that workplace and social support are important in proactive safety behavior. Given the research findings and the connectedness between each variable, it is relevant to carry out other quantitative studies to determine the research model consistency. Although qualitative research is perceived as valid and reliable given the undertaken process and procedures, it is constructive to test and confirm the research model with a specific quantitative measurement.

At the beginning of the chapter, I have mentioned how the findings of this study will assist in developing a research design for the following research. As I have revealed in Chapter One, this thesis is developed by three different studies to answer all the research objectives. Study One is meant as an avenue to understand the young workers’ proactive safety behavior that encompassed three different factors, namely proactive ability, proactive motivation, and proactive opportunity, as depicted in Figure 4.1 in Chapter Four. The analysis was divided into two divisions; analysis with Nvivo according to Membership Categorization Device Analysis and analysis with Leximancer. Both analyses captured the core elements representing and explaining the research framework as depicted in Chapter Four. However, the analysis with Leximancer strengthens the basis of the forthcoming quantitative research for this thesis namely for Study Two and Study Three. Based on the visual map in Figure 5.2, it is important to justify here that according to the categories presented, and it is hypothesized that proactive ability, proactive motivation and proactive opportunity will influence proactive safety behavior. However, the magnitude of the effect probably differs, and this assumption can only be proven through Study Two and Study Three. Furthermore, based on the findings of Study One, it is estimated that proactive motivation will influence proactive safety behavior more than proactive ability and proactive opportunity. This assumption is made based on the analysis protocols that were mentioned earlier. The data relevancy is based on
the concepts in each category and also the position of the circle in the visual map. Comparing proactive ability, proactive motivation and proactive opportunity, proactive motivation has the most concepts and more relevant to proactive safety behavior. Although proactive ability is also located very close to proactive safety behavior, it has the least concepts. Therefore, making it possible to assume that it has a low relevancy to proactive safety behavior.

Therefore, for Study Two and Study Three, I will conduct quantitative research based on the predetermined model. Study Two will involve the process of measurement validation and reliability analysis. In Study Three, I will carry out longitudinal research to identify the relationship between the independent and dependent variables. Findings for the studies will be discussed in Chapter Six and Chapter Seven.
Chapter 6

Study 2: A Two-sample Study of the Relationship between Proactive Ability, Proactive Motivation, Proactive Opportunity, and Proactive Safety Behavior

6.1 Overview

In this chapter, I present the findings of a study that builds upon the conceptual model that I have developed earlier in this thesis. The proposed conceptual model is reproduced below.

![Model of the relationship between proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior]

*Figure 6.1.* Model of the relationship between proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior

The primary objective of this study is to test the core relationships specified within the conceptual model, specifically that young workers’ proactive safety behavior will be correlated with their ability, motivation, and opportunity to be proactive. In doing so, the study will also seek to test the robustness of various measures used and the generalisability of these proposed relationships by
examining them within two samples of young working people in Malaysia and Australia. An important step in this research is to identify the psychometric properties of the translated and adapted measures.

6.2 Method

6.2.1 Participants and procedures

All participants participated in the study by completing an online survey located on the University of Western Australia’s Qualtrics platform. Details of the procedures used to recruit participants varied across the Malaysian and Australian samples, as described below.

Malaysian sample. In the first instance, I contacted several Malaysian government ministries known to employ significant numbers of younger workers, including the Ministry of Youth Development, Ministry of Human Resources (MOHR), Ministry of Health (MOH) and Ministry of Higher Education (MOHE), following up with letters inviting the ministry to take part in the research. However, only one ministry (MOHE) agreed to allow the researcher access to recruiting participants. I also contacted students of The National University of Malaysia and invite them to participate. This was done according to protocols approved by UWA Research Ethics. The ministry forwarded the email I have sent to the employees including the link to the survey that also consisted of the consent forms. In the survey coversheet, the employees were informed that they are not required to participate in the survey and that they were allowed to withdraw from participation at any time.

Altogether, I was successful in recruiting 82 participants from MOHE. Given that this sample size would prove to be too small for the analyses I had in mind, I sought additional participants from the higher education system itself. I contacted colleagues from the Faculty of Social Sciences
and Humanities, The National University of Malaysia (UKM), and asked for their assistance to distribute the survey to undergraduate students who were also likely to meet the definition of young workers. The undergraduates fulfilled all minimum requirements (e.g., 18-28 years old, with working experience).

In total, 311 completed survey responses were received, consisting of 82 employees from the Malaysian Ministry of Higher Education, and 229 undergraduates enrolled in the Faculty of Social Sciences and Humanities at the University Kebangsaan Malaysia. In the combined sample, 37 observations were recorded as missing data for not giving any responses after agreeing to participate. Nine other participants were recorded as completing only 70 percent of the survey. In these cases, the missing values were replaced by mean substitution in SPSS. Five observations were identified as outliers and removed from the dataset. In total, therefore, 260 observations were retained for the Malaysian participants.

Before deciding to combine the two Malaysian samples, I conducted a T-test to see if the sample is different after all. The findings indicated that there was not a significant difference in the scores of proactive safety behavior (Self-Determination Perspective) for the employees at the ministry (M=4.29, SD=.54) and the undergraduate sample (M=4.12, SD=.61) conditions; t(258)=.13, p = .20. Therefore, the decision to combine the sample is permissible.

The sample was predominantly female (N=167), with women constituting 63 percent of the overall participants. Most of the undergraduate student participants were female, which is in line with the recent publication of the student ratio of females to males of 62:38 (Ministry of Education, 2016). The average age of the participants was 23.85 (SD=4.55), which was consistent with the student sample age distribution between 20-24 years old. The average job tenure was 1.73
On average, in the past two years, the participants have received 1.9 hours of safety training.

*Australian sample.* The process of recruiting Australian undergraduates as research participants were conducted using the UWA Business School SONA System. The SONA System is a research management tool that allows the participants, researchers, principal investigators, and instructors to set up studies such as surveys through a simple web-based interface that can be accessed at any time, anywhere. Within the undergraduate Organisational Behavior unit, students can participate in approved research studies for credit (see Appendices 2). After receiving approval for the study from the UWA Human Research Ethics Committee; I created a study in the SONA System, entitled ‘Proactive Safety Behavior of Young Workers: Identifying Causes and Antecedents.’ Participants in the study were invited to spend 20-25 minutes to complete the survey, and they will be granted one (1) credit point towards their overall assessment grade in the unit upon completing the survey. The credit given is determined by the amount of time expected to complete the study; for example, 0 to 1 hour is equal to 1 credit. In total, there were 274 responses gathered from the UWA Business School SONA System. I then screened the observations for any missing data and outliers. No missing data were detected. However, four observations were detected as outliers and dropped from the survey.

Altogether, there were 145 female participants (52.9%) and 126 (46.0%) male participants, while the remaining 3 participants chose not to answer the gender question (11%). The average age of the participants was 19.81 years (SD=2.74) in line with the undergraduate student's age distribution between 19-22 years old. The participants who took part in this survey, on average, have worked 1.56 years (SD=0.76). Finally, the participants indicated on average that they had complete 2.22 hours of training (SD=1.23).
6.2.2 Measures

Proactive Ability. Two established individual difference measures were used to operationalize a person’s inherent capacity to be proactive. The first, proactive personality, is defined as a personal and stable disposition of an individual, such as taking action to change themselves and to influence the environment (Bateman & Crant, 1993). A proactive individual is active in scanning opportunities, persistent and continually changing themselves and the environment (Bateman & Crant, 1999; Crant, 2000; Crant, 1996) To measure proactive personality, I used 6-item version of the Proactive Personality Scale (PPS) (Crant, 2000), developed by Parker (1998). Sample items in this scale include ‘If I see something I don’t like, I fix it,’ ‘I love being a champion of my ideas, even against other’s opposition’ and ‘I excel at identifying opportunities,’ with possible scale responses ranging from 1 (strongly disagree) to 5 (strongly agree).

The second construct used to capture proactive ability was the individual locus of control. Locus of control is a stable trait, defined as a state of internal control and agency that a person has that leads them to think that whatever happens to them is due to their abilities, actions or wrongdoings (Levenson, 1973; Sapp & Harrod, 1993). Those with an active internal locus of control are more likely to feel able to take control of their actions and futures, and hence to be proactive. In contrast, those with an external locus of control are more likely to think that external factors determine how they act, and hence are less likely to feel able to act proactively to shape their future at work. To assess locus of control, I used the nine items from Sapp and Harrod’s (1993) short form of Levenson’s (1973) measure of chance control, a power control (both types of external locus of control), and internal control. The three items for each dimension used a 7-point Likert-scale response format, ranging from 1 (strongly disagree) to 7 (strongly agree). Sample items include ‘My life is determined by own actions’ (Internal), ‘People like myself have very little
chance of protecting our interests where they conflict with those of strong pressure groups’ (Power) and ‘When I get what I want, it’s usually because I’m lucky’ for (Chance).

Proactive Motivation. I included items assessing three aspects of proactive motivation. ‘Can do’ proactive motivation is a form of self-efficacy that refers to an individual’s confidence to execute a given task beyond the normal routine or to carry out jobs proactively (Axtell & Parker, 2003). To assess this aspect, I used ten items from the Role Breadth Self-Efficacy (RBSE) scale developed by Parker (1998). The RBSE scale has been found to be reliable as well as distinct from measures of proactive personality (Hwang, Han, & Chiu, 2015; Sharon K Parker, 1998, 2000). Respondents are asked how confident they are in executing various tasks, using a 5 point Likert scale that ranges from 1 (not at all confident) to 5 (very confident). The tasks include analyzing a long-term problem to find a solution, writing a proposal to spend money in your work area, and presenting information to a group of colleagues.

‘Reason to’ motivation is a cognitive condition that motivates an individual to engage in his/her job (Strauss & Parker, 2014). I used The Situational Motivation Scale (SIMS) (Guay, Vallerand, & Blanchard, 2000) to evaluate the individual’s reasons for seeking to perform their tasks proactively. The measure is derived from Self-Determination Theory (SDT) that deals with the importance of intrinsic and extrinsic motivation in enabling individuals to engage in an activity (Standage, Darren , Joan , & Keven, 2003). This scale is proven to be distinct from other SDT related scales (Lonsdale, Sabiston, Taylor, & Ntoumanis, 2011; Weissinger & Bandalos, 1995) and robust in a sense that it measures motivation according to the self-determined perspective (intrinsic motivation and identified regulation) and a non-self determined perspective (external regulation and amotivation) (Gao, Podlog, & Huang, 2013; Guérin & Fortier, 2013). Through the questions, the participants provide reasons that motivate them to engage in their work, which may reflect either intrinsic or extrinsic motivation. The statements include ‘Because I think that it is interesting,’
‘Because this work is fun’ and ‘Because I believe that this work is important to me.’ The scale has 16 items, with responses on a scale ranging from 1 (corresponds not all) to 7 (corresponds exactly). It is divided into four subscales; intrinsic motivation (α=.95), identified regulation (α=.80), external regulation (α=.86) and amotivation (α=77), with four items for each subscale.

‘Energized to’ motivation is a high activation positive state of a person that motivates them to be proactive (Bindl & Parker, 2010). It is about a person’s ability to produce and sustain psychological resources that will enable them to achieve proactive goal regulation (Strauss & Parker, 2014). High activation is a critical driver in motivation because of its catalytic nature in the human psychological process (Bindl et al., 2012; Brehm, 1999). Although, in most cases, a high positive activation is highly correlated with proactivity (Greenglass & Fiksenbaum, 2009; M. Salanova & Schaufeli, 2008; Sonnentag et al., 2008), there are indicative findings of a positive correlation between a high negative activation to proactive behavior (Lamm, Pine, & Fox, 2013; Luu, 2017). However, continued dependence on negative high affective states towards proactive behavior will lead to burnout and dissatisfaction at work (De Raedt & Hooley, 2016; Madrid, Patterson, & Leiva, 2015; Wu et al., 2013). To measure this aspect, I used the ten item-International Positive and Negative Affect Schedule (PANAS) Short Form (I-PANAS-SF) scale (Thompson, 2007). Sample items include ‘inspired’ for positive affect and ‘upset’ for negative affect. There are five items, each for positive affect and negative affect, with responses ranging from 1 (Never) to 5 (Always).

*Proactive Opportunity*. In this study, the proactive opportunity was operationalized as the contextual or situational resources that support proactive behavior. It was derived from the definition of opportunity, which refers to future-oriented work practices that promote social support, autonomy, and participation (Debusscher, Hofmans, & De Fruyt, 2017; Ehrnrooth & Björkman, 2012; Haynie et al., 2009). In the Job Demands-Resources model, the opportunity is thoroughly
discussed and explained through job resources that help to positively influence job performance (Crawford, LePine, & Rich, 2010; Donoso et al., 2015). Therefore, I extracted job resources items from the Job Demands-Resources questionnaire (Bakker, Demerouti, & Verbeke, 2011); autonomy, possibilities for professional development, and social support from colleagues to explain the importance of workplace job resources in proactive safety behavior. An example of the item for autonomy was ‘Do you have flexibility in the execution of your job?’, with range score of 1 (Never) to 5 (Very Often), possibilities for professional development sample item was ‘In my work, I can develop myself sufficiently’ ranged from 1 (Strongly disagree) to 5 (Strongly agree) and finally example item for social support was ‘If necessary, can you ask your colleagues for help?’, from 1 (Never) to 5 (Sometimes).

**Proactive Safety Behavior (PSB).** I adapted items from two established scales to assess proactive safety behaviors first set of items were based on the four dimensions of proactive behavior (envisioning, planning, enacting, and reflecting) identified by Parker and her colleagues (Parker & Wang, 2015; Strauss & Parker, 2014). I adapted existing measures of proactive behavior (Bindl, Parker, Totterdell, & Hagger-johnson, 2012; Griffin, Neal, Parker, Griffin, & Parker, 2007) to refer to a safety behavior context. For example, the original proactive behavior item ‘Initiated better ways of doing my core tasks’ became ‘Initiated better ways of doing my core tasks more safely.’ Items were generated to reflect the four proposed dimensions of proactive safety behavior. Sample items include ‘I think about ways to improve workplace safety’ (Envisioning), ‘I go through different scenarios in my head about how to make changes to create a safer workplace’ (Planning), ‘I monitor the effect of my attempts to change safety behavior’ (Reflecting), and 'I make changes to the way my core tasks are done to make them safer to perform' (Enacting).

The second set of items designed to measure proactive safety behavior were taken from the measure of safety citizenship behavior developed by Hofmann, Morgeson, & Gerras (2003a). This
measure includes three elements; safety-related volunteerism, safety knowledge, and safety and workplace changes (Hofmann et al., 2003). Previous research on proactive safety behavior made use of the measurement of safety citizenship role definition and behavior (see Curcuruto & Griffin, 2016, 2018; Fugas, Meliá, & Silva, 2011; Fugas, Silva, & Meliá, 2012, 2013). Theoretically, it is crucial to prove that safety citizenship role definition and behavior measurement is distinct from the measurement of proactive safety behavior proposed in this research. Some of the items used were ‘Volunteering for safety committees,’ ‘Taking action to stop violations of safety procedures to protect the well-being of other employees,’ ‘Attending safety meetings,’ and ‘Keeping informed of changes in safety policies and procedures.’

**Demographic information.** At the end of the survey, all participants were asked to answer four biographical information such as age, gender, job tenure, and safety training exposure. Also, as research participation incentive, the Malaysian participants were invited to provide their email address so that they can be entered into a lucky draw. The Australian participants, however, were granted one credit for participation, therefore, excluded from the lucky draw.

**Translation and cultural adaptation methods.** English is a second language in Malaysia, meaning that it is more convenient for the Malaysian participants if the instruments are adapted for the Malay language. I followed a specific translation and cultural adoption method for this sample. Conceptually, adaptation involves choosing a well-established method for translation, selecting translators, and determining the linguistic and literal equivalence (Hambleton, 2005). An adapted instrument is required because most of the instruments are developed in English speaking countries (Beaton, Bombardier, Guillemin, & Ferraz, 2000; Kushner, 2003), and would be difficult for participants who are not sufficiently English-literate to comprehend (Edwards, 2010; Lim, Liong, Karim Khan, & Yuen, 2016).
Following Hambleton (2005)'s suggestions, I chose linguistic translation as an approach and back translation as an adaptation method. The linguistic translation is defined as a translation that is grammar-focused, has an equivalent meaning between the source language and target language, should have similar psychometric properties, and related to the cultural, social, and political context (Anita Prieto, 1992; Gudmundsson, 2009; Vermeer, 1992). Linguistic translation has advantages over another translation approach because it provides equivalence, a goal that impossible to achieve should a translation being done by a literal translation (Ferrer et al., 1996). Equivalence is when two sets of instruments of the same constructs are compared and agreed upon to be valid (Chang, Chau, & Holroyd, 1999; Edwards, 2010; Harkness & Schoua-Glusberg, 1998; van de Vijver & Tanzer, 2004), free from cultural bias and acceptable and relevant in the culture (Douglas & Craig, 2007; Wu, Yang, & Koo, 2017). However, to achieve the instrument equivalence, a researcher must choose the most appropriate method for translation, and therefore I chose back translation.

Back translation is a method that can produce equivalence to the research instruments and consequently, the research findings (Brislin, 1970; Greco, Walop, & Eastridge, 1987; Triandis & Brislin, 1984) because an equivalence is provided through a detailed examination of an instrument’s accuracy produced by multiple translators and translations (extra checks) (Salman Saleem & Jorma Larimo, 2015). Back translation is a three-step process (translate to TL, translate back to SL and compare the versions) (Maxwell, 1996), that requires the document from a source language (in this case English) is translated into the target language (Malay) by a bilingual translator and then blind translated the instrument back into the SL, with all incongruities are discussed between the translators (Brislin, 1970, 1986; Jones, Lee, Phillips, Zhang, & Jaceldo, 2001).

To ensure the instrument’s accuracy, the selection of translators was conducted according to guidelines provided by Brislin (1986) and Martin, Kelly, Adams, Garden, & Jones (1996); formal qualification as a translator into the target language, first-language experience in the target
language, excellent knowledge of English, experience living and working in an English-language environment and familiarity with the culture associated with the target language. Seven steps were followed to conduct the translation process. In Step One, I translated the scale into the Malay language. In Step Two, I asked another translator whose expertise is in Malay and the English language to translate the material back into the English language. Also, I asked another translator to translate the measures from the English language to the Malay language. In Step Three, I have handed over the measures in the English language to another translator who has proficiency in both language and the subject matter (Squires, 2009). The translator that was assigned to this task has a master's degree in Human Resource and has 15 years of working experience in a private company. In Step Four, any discrepancies in translation/back-translation were discussed between translators. All translated instruments and the original version in English were brought together for comparison and modified until the translation result is agreeable by the researcher and the translators. (Anderson, 2008; Zhao & Katsuya Kanda, 2000). This stage is extremely critical and time-consuming (Formea et al., 2014). Translators are encouraged to maintain the meanings despite having to make some minor changes during deliberation (McCrae & Costa, 1997). In Step Five, the translated instrument was distributed to potential respondents for pilot testing (Chapman & Carter, 1979).

For quantitative research, at least 100 respondents are required to achieve reliability and validity (Zolotor et al., 2009). In this step, I have distributed the original instrument in the English language to the Australian participants and the translated version to the Malaysian participants. In Step Six, I gather and analyze all the data. Instrument reliability and validity from both populations will be examined and compared. Similarities and differences in the responses will be scrutinized. If the proposed model is achieved and proven to have model fit, therefore, the instrument reaches the level of reliability and validity (Choi, 2003). In Step Seven, I will distribute the translated version to the Malaysian participants for Study Three.
6.2.3 Analyses

Data cleaning. I performed data cleansing by identifying the outliers and the missing values. All cases that went unanswered for less than 70 percent were deleted based on the Listwise Deletion protocol (Bingham, Stemmler, Petersen, & Graber, 1999; Kang, 2013).

Exploratory factor analysis. After the elimination of outliers and missing data, I used exploratory factor analysis to examine the underlying structure of the data and to provide a preliminary assessment of the degree to which the data reflected the proposed measurement model. As this study is aiming to test a theoretical model, not the population model, a sample size of N ≥ 200 was considered sufficient for the conduct of EFA (Barrett, 2007; Fabrigar, Wegener, MacCallum, & Strahan, 1999; MacCallum, Widaman, Zhang, & Hong, 1999). The Statistical Package for the Social Sciences (SPSS) version 23 was used to execute the EFA.

To begin with, I first performed a reverse coding procedure. Reverse coding is an attempt to standardize item direction by ‘reverse scoring’ all negative statements (Mielenz, Callahan, & Edwards, 2017). This procedure is important because failing to do so will cause the negative responses loaded higher and grouped in another separate factor (Couch & Kenniston, 1960). To perform the EFA, I followed Gorsuch’s (1988) guidelines and chose Principal Axis Factoring (PAF) as an extraction method with Promax rotation. I chose Promax rotation because it can recover all pertinent factors, even the weakest one (de Winter & Dodou, 2012), and can provide a simple factor structure while allowing the factors to be correlated (Fabrigar et al., 1999). To determine if the sample size is sufficient for factor extraction, I used the KMO Test and Bartlett’s Test of Sphericity to examine the sampling adequacy for factor analysis. KMO Test Measure of Sampling standards are as follow; 0.00 to 0.49 unacceptable, 0.50 to 0.59 miserable, 0.60 to 0.69
mediocre, 0.70 to 0.79 middling, 0.80 to 0.89 meritorious and 0.90 to 1.00 marvellous (Kaiser, 1974b) and the result between .8 to 1 reflecting the best cut-off point and fit for factor analysis (Watson & Gassett, 2003). Bartlett’s Test of Sphericity (Snedecor & Cochran, 1967) is another test that should be performed alongside KMO Test Measure of Sampling to identify homogeneity and normal distribution (the bell curve) of the population. If the finding of Bartlett’s Test of Sphericity indicated a significant <.001 (Hogarty, Hines, Kromrey, Ferron, & Mumford, 2005) therefore the data is worth studying for (Dombrowski, McGill, & Canivez, 2016; Farrell, 2009) and the variables within the population is correlated (Wongpakaran, Wongpakaran, & Ruktrakul, 2011).

When performing EFA, I paid particular attention to cross-loading items and items that were loaded extraordinarily high or extremely low on specific factors. Also, I examined whether the findings manifested a simple structure of factorial patterns that were similar to those specified within the proposed framework. The process of EFA was repeated many times until a satisfactory factor structure was established. Item deletion caused the repetition, a condition where a decision has to be made based on the factor analytic principles. The loading standards by Comrey & Lee (1992) are achieved if the factor loading is squared to attain the percentage of variance. Therefore, when .32 is squared, it indicates .10, which means only 10% of the value is shared and closer to the mean value while the remaining 90% is shared elsewhere (Dombrowski et al., 2016). Hence, based on the loading standard by Comrey & Lee (1992), all values under .45 are weak and will not show any significant contribution to the factor (Cabrera-Nguyen, 2010). Therefore, given the procedure, I will retain factors with .45 for this study. For the number of items per factor, I will follow Eigenvalues ≥1, the scree plot, and three items per element for EFA.

**Confirmatory factor analysis.** Confirmatory Factor Analysis (CFA) is another form of factor analysis. Like EFA, CFA is also a theory-driven analysis (Clayton, 2015). It can measure the convergent and discriminant validity CFA (Farrell, 2009) and also confirm the hypothesis; to prove
an established relationship between observed variables and their underlying latent constructs (Suhr, 2006). I used SEM-AMOS for the analysis because it can test hypotheses based on a theoretically specified model (Feinian Chen, Curran, Bollen, Kirby, & Paxton, 2008). For model fit assessment, I used Hu & Bentler (1995)’s threshold or cut-off point namely; chi-square/df ratio ($\chi^2$/df), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Standardized Root Mean Square Residual (SRMR), Root Mean Square Error of Approximations (RMSEA) and PClose. However, since GFI and AGFI indices are very sensitive to sample size, these indices were disregard as to the goodness of fit index, as recommended by Sharma, Mukherjee, Kumar, & Dillon (2005).

Chi-square/df ratio ($\chi^2$/df) is a traditional way of measuring model fit (Baron & Kenny, 1986), and any values of <3 are good and acceptable. Chi-square/df ratio is a way of measuring the model goodness of fit based on the sample size distribution by determining the normality distribution of the sample (Hancock, 2006) and a low $\chi^2$/df will indicate a good fit (Hoe & SL Hoe, 2008). Comparative Fit Index (CFI) is used to measure model fit if the sample size is small (Tabachnick & Fidell, 2007) and to overcome the overestimation value provided by Chi-square/df ratio goodness of fit test (Bentler, 1990). If CFI value is 1, it indicates the best fit, > 0.95 indicates a good fit while >.90 is acceptable (Rigdon, 1996). Standardized Root Mean Square Residual (SRMR) explains the differences between the data and the model (Livheim et al., 2016), hence if the SRMR .000 (NIL differences), it indicates the best fit value (Weston & Gore, 2006). Since the formulation takes into account the data, therefore, SRMR index is sensitive to sample size (Hooper, Coughlan, & Mullen, 2008), and the value of $\leq$.08 demonstrates a good fit model (Schreiber, Nora, Stage, Barlow, & King, 2006). Root Mean Square Error of Approximations (RMSEA) is a popular measure of fit (Maccallum, Widaman, Preacher, & Hong, 2001); it is distinct from other fit indices because it can measure both sample estimates and inferential analysis (Kelley & Lai, 2011).
Possible index values range from <.05 for a close fit; .05-.10 as fair; >.10 is a poor fit (Browne & Cudeck, 1992) but the perfect fit value for RMSEA is zero. If the RMSEA value is zero or close to zero, we can accept the null hypothesis and the model has a good fit (Kenny, Kaniskan, & McCoach, 2015).

Table 6.1

*The threshold value for Goodness of fit (Hu & Bentler, 1999)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Threshold value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square/df (CMINdf)</td>
<td>&lt;3 good</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt;.95 great; &gt;.90 acceptable</td>
</tr>
<tr>
<td>SRMR</td>
<td>&lt;.09</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt;.05 good; .05-.10 moderate; &gt;.10 bad</td>
</tr>
<tr>
<td>PCLOSE</td>
<td>&gt;.05</td>
</tr>
</tbody>
</table>

**Determining construct validity**

One of the most essential elements in determining measurement validity is construct validity. Construct Validity; a validity that is at its highest level in the internal validity hierarchy (Lawshe, 1975), explains the degrees of strength (Explanatory Power) (Peter, 1981), quality of an instrument and the interpretation of a relationship between the variables (Cronbach & Meehl, 1956). One way to achieve validity is through Factor Analysis (Allen & Meyer, 1996; Onwuegbuzie & Johnson, 2006), which has a detailed explanation about Convergent Validity, Discriminant Validity, and Reliability (reliability) (Thompson & Daniel, 1996). The convergent and discriminant validity and reliability are different (Bagby, Taylor, & Parker, 1994) but related to each other (Arthaud-Day, Rode, Mooney, & Near, 2005; Brackett & Mayer, 2003). The findings are the element to determine whether the items are sufficient and can measure each factor (Stöber, 2001; Watson et al., 1988). If
the factors fail to show a degree of convergence or discriminant validity, any attempt to test the relationship is useless (Alumran, Hou, Sun, Yousef, & Hurst, 2014; Fischer et al., 2000). The convergent validity of each factor is interpreted through the average Shared Variance (AVE) > .5 as recommended by Hair, Black, Babin, & Anderson (2010). AVE is the average amount of variance in observed variables that a latent construct can explain (Farrell, 2009). The threshold for Average Variance Extracted (AVE) is >.5 as recommended by Hair, Black, Babin, & Anderson (2010) indicates latent constructability to explain 50% of the shared variance for convergent validity (Clayton, 2015). A factor has fulfilled a necessary criterion of convergence if it demonstrates a strong correlation (> .7) between items per factor (Gefen, Straub, & Boudreau, 2000) to describe the factor (Henseler, Ringle, & Sarstedt, 2014). The discriminant validity emphasizes the items' capacity to be distinct from other factors other than its parent factor (Campbell & Fiske, 1959; Lehmann, 1988). To determine whether the items do not correlate with other factors, the researchers will monitor the Maximum Shared Squared Variance (MSV) as a benchmark (Mussel, 2010). A factor is distinct if the MSV value is smaller than the AVE (Devon et al., 2007).

For reliability, most researchers will be contented if Cronbach’s Alpha reaches .70 and above (Peterson, 1994). However, Cronbach's Alpha reading is necessary but insufficient (Al-Osail et al., 2015). Cronbach's Alpha value is the most basic reliability testing and can be used if a model has only one factor (N. Schmitt, 1996). But for more complex models, researchers are advised to use Composite Reliability (CR), and Maximal Reliability (MaxR (H)) because these tests can accurately measure reliability (Raykov, Gabler, & Dimitrov, 2016). CR reading is achieved when all the 'standardized' items are allowed to correlate with each other (Intra-Class correlation). Therefore CR is more suitable for a complex and multidimensional model (Bacon, Sauer, & Young, 1995). The benchmark in evaluating CR is > .7, and usually, MaxR (H) has a higher reading than CR (Raykov, 1998, 2004). If the AVE value is less than .5 as suggested above, the items can correlate with other factors than its parent factor. When this happens, researchers will have to re-examine the CR. If the
CR reading for that factor is more than .7, then the constructs are considered sufficient even if it is less than the recommended value reading (Fornell & Larcker, 1981).

**Multiple regression.** To examine the relative strength of the relationship between the variables on the lefthand side of the conceptual model and proactive safety behavior, I used stepwise multiple regression. Demographic and other control variables were entered as a first step. In this study, these included Gender, Age, Safety Training and Job Tenure. The three focal variables (proactive ability, proactive motivation, and proactive opportunity) were then entered as a block in Step 2. The aim was to see which variables accounted for unique variance in the prediction of proactive safety behavior and to determine how much of the overall variance in proactive safety behavior was accounted for by these three variables.

### 6.3 Results

#### 6.3.1 Malaysian sample

As mentioned earlier, there were 260 valid survey data recorded from the Malaysian participants. For EFA, the first step involved measuring the sampling adequacy specifically with KMO Test and Bartlett’s Test. The KMO Test Measure of Sampling was .89, deemed as ‘meritorious’ (Kaiser, 1974a). Bartlett’s Test of Sphericity was also significant at .00. The findings from both tests indicate an adequate sample size in producing a reasonable factor analysis. The EFA provided seven factors with an eigenvalue of ≥1, with 33 items loading on these factors (≥.45). The percentage of variance explained by these seven factors was 62.7%. The scree plot specified a sharp elbow at 7 points indicating a 7-factor solution for EFA. All items under .45 were dropped, and there was a minimum of three items per factor.
Figure 6.2  Scree plot with Eigenvalue (Malaysian sample)
Table 6.2

Exploratory Factor Analysis Eigenvalues and Total Variance Explained in 7-Factor solution in Study 2 – Malaysian Sample

<table>
<thead>
<tr>
<th>Factor</th>
<th>Explained Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>28.27</td>
</tr>
<tr>
<td></td>
<td>10.74</td>
</tr>
<tr>
<td></td>
<td>7.22</td>
</tr>
<tr>
<td></td>
<td>6.05</td>
</tr>
<tr>
<td></td>
<td>3.86</td>
</tr>
<tr>
<td></td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>3.05</td>
</tr>
</tbody>
</table>

Proactive Safety Behaviour (Safety Citizenship Role Definition and Behavior)
- Trying to prevent other people I work with from being injured on the job .93
- Taking action to stop violations of safety procedures to protect the well-being of other employees .89
- Explaining to other crew members that I will report safety violations .86
- Telling other crew members to follow safe working procedures .84
- Expressing opinions on safety matters even if others disagree .83
- Monitoring new crew members who violate safety procedures .74
- Helping teach safety procedures to new employees .68

Proactive Motivation ‘Reason to’
- Because I think that it is pleasant .90
- Because I think that it is good for me .83
- Because this work is fun .80
- Because I believe that this work is important to me .74
- Because I feel good when doing this work .74
- Because I am doing it for my own good .61

Proactive Motivation ‘Can do’
- Helping to set targets/goals in your work area .89
- Designing new procedures for your work area .88
- Writing a proposal to spend money (in your work area) .85
- Presenting information to a group of colleagues .70
- Analyzing a long-term problem to find a solution .55

Proactive ability
- No matter what the odds, if I believe in something, I will make it happen .85
- I believe in an idea, no obstacle will prevent me from making it happen .70
- I love being a champion for my ideas, even against others’ opposition .66
- I am always looking for better ways to do things .58
- If I see something I don’t like, I fix it .56

Proactive safety behavior (Self Determination Perspective)
- I go through different scenarios in my head about how to make changes to create a safer workplace .80
- I think about how my tasks could be performed more safely .79
- I think about ways to improve workplace safety .77
- I think carefully about how my ideas for improving workplace safety can be implemented, before deciding how to act .74

Proactive opportunity
- If necessary, can you ask your colleagues for help? .88
- Can you count on your colleagues to support you, if difficulties arise in your work? .88
- In your work, do you feel valued by your colleagues? .76

Proactive Motivation ‘Energized to’
- Nervous .83
- Afraid .69
- Upset .49

Eigenvalues
- 9.67
- 3.86
- 2.75
- 2.38
- 1.64
- 1.52
- 1.38

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 6 iterations.
Altogether, 33 items were extracted through the analysis. The first factor, proactive safety behavior (Safety Citizenship Role Definition and Behavior), accounted for a total of 28.27 explained variance. Proactive motivation (Energized To) accounted for the smallest explained variance with 3.05. All factors were labeled according to the proposed theoretical framework.

The results of the CFA for the Malaysian sample are depicted in Figure 6.3. Overall, the fit indices ($\chi^2$/df=1.53, CFI=.96, SRMR=.05, RMSEA=.05, and P-close .88) indicate that good model fit has been achieved. All factor loadings were greater than .5. After some item deletions, a total of 29 items retained with a 6-factor solution. The resulting correlation matrix for the variables assessed in this study (Malaysian sample) is presented in Table 6.2.

The main reason for proactive safety behavior (Safety Citizenship Role Definition and Behavior) is included in this research to distinguish them from proactive safety behavior (Self-Determination Perspective). The EFA findings indicated that the two constructs are representing two different factors and proven to be distinct from each other (see Matsunaga, 2011; Yang & Xia, 2015). However, proactive safety behavior (Safety Citizenship Role Definition and Behavior) is dropped in the CFA. This is to determine if the six-factor solution that I proposed in the research framework is permissible. The findings indicated that the six-factor solution is accepted with a substantial model fit. This rule also applied to the Australian sample. For this research, the dependent variable being tested is proactive safety behavior.

The results of the Stepwise Regression analysis for the Malaysian participants are presented in Table 6.4.
Figure 6.3  Measurement model for Proactive AMO-PSB for the Malaysian participants

χ²/df=1.53  
CFI=.96  
SRMR=.05  
RMSEA=.05  
PClose .88
Table 6.3

*Means, Standard Deviations, control variables, and Inter-correlations among Study Variables for the Malaysian sample*

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>260</td>
<td>23.85</td>
<td>4.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td>250</td>
<td>1.63</td>
<td>.500</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Job tenure</td>
<td>250</td>
<td>1.73</td>
<td>1.03</td>
<td>.80**</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Safety training</td>
<td>250</td>
<td>1.90</td>
<td>.89</td>
<td>.23**</td>
<td>.11</td>
<td>.33**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Proactive Ability</td>
<td>250</td>
<td>5.36</td>
<td>.85</td>
<td>-.01</td>
<td>-.14*</td>
<td>.11</td>
<td>.15*</td>
<td>(.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Proactive Motivation - Can Do</td>
<td>250</td>
<td>5.61</td>
<td>1.11</td>
<td>-.31**</td>
<td>-.08</td>
<td>-.04</td>
<td>.01</td>
<td>.23**</td>
<td>(.60)</td>
<td></td>
</tr>
<tr>
<td>7. Proactive Motivation - Reason To</td>
<td>250</td>
<td>5.77</td>
<td>1.02</td>
<td>-.10</td>
<td>-.03</td>
<td>.00</td>
<td>.00</td>
<td>.36**</td>
<td>.53**</td>
<td>(.76)</td>
</tr>
<tr>
<td>8. Proactive Motivation - Energized To</td>
<td>250</td>
<td>2.78</td>
<td>.98</td>
<td>.32**</td>
<td>-.06</td>
<td>-.10*</td>
<td>.13*</td>
<td>.14*</td>
<td>.20**</td>
<td>.13*</td>
</tr>
<tr>
<td>9. Proactive Opportunity</td>
<td>250</td>
<td>3.06</td>
<td>1.07</td>
<td>-.05</td>
<td>.06</td>
<td>-.01</td>
<td>.04</td>
<td>.06</td>
<td>.07</td>
<td>.17**</td>
</tr>
<tr>
<td>10. Proactive Safety Behaviour</td>
<td>260</td>
<td>4.00</td>
<td>.82</td>
<td>-.15*</td>
<td>.05</td>
<td>-.02</td>
<td>-.02</td>
<td>.28**</td>
<td>.52**</td>
<td>.51**</td>
</tr>
</tbody>
</table>

N=260

*Note: Internal consistency reliabilities appear in parentheses along the diagonal.*

* Correlation is significant at p ≤ .005    **Correlation is significant at p ≤ .001
Table 6.4

*Results of regression analysis predicting proactive safety behavior (PSB) for the Malaysian sample*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>β</td>
</tr>
<tr>
<td>Gender</td>
<td>.05</td>
<td>.09*</td>
</tr>
<tr>
<td>Age</td>
<td>-.47</td>
<td>-.11</td>
</tr>
<tr>
<td>Safety Training</td>
<td>-.01</td>
<td>-.02</td>
</tr>
<tr>
<td>Job Tenure</td>
<td>.34*</td>
<td>.12*</td>
</tr>
<tr>
<td>Proactive Ability</td>
<td>.06</td>
<td>.07</td>
</tr>
<tr>
<td>Proactive Motivation - Can Do</td>
<td></td>
<td>.32**</td>
</tr>
<tr>
<td>Proactive Motivation - Reason To</td>
<td></td>
<td>.28**</td>
</tr>
<tr>
<td>Proactive Motivation - EnergizedTo</td>
<td></td>
<td>.13*</td>
</tr>
<tr>
<td>Proactive Opportunity</td>
<td>.27**</td>
<td>.27**</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.08</td>
<td>.43**</td>
</tr>
<tr>
<td>ΔF²</td>
<td>5.56</td>
<td>44.58</td>
</tr>
<tr>
<td>d.f</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Total R²</td>
<td>.08</td>
<td>.51</td>
</tr>
<tr>
<td>F</td>
<td>5.56**</td>
<td>29.34**</td>
</tr>
</tbody>
</table>

N=260. * Coefficient is significant at p ≤ .05  **Coefficient is significant at p ≤ .01

In the first step, I entered the demographic data to control any possibilities of confounding effects. In this step, only job tenure (β=.34) significantly predicted proactive safety behavior; proactive safety behavior is expected to be high with longer job tenure. R² is accounted for 8%. In
Step 2, I added all predictors; proactive ability, proactive motivation, and proactive opportunity. There are changes and significant findings that can be interpreted from the table. In Step 2, Gender ($\beta=.09$) appeared to be a significant but weak predictor to proactive safety behavior, while it was not in Step 1. Age is constant to be insignificant, and its value decreased in Step 2 ($\beta=-.11$). Job tenure ($\beta=.12$) prediction power was reduced but still significant when it was included along with other predictors in Step 2. The prediction power of safety training, however, was insignificant in Step 1 and Step 2. It was postulated that safety training would have a significant prediction power towards proactive safety behavior. However, the assumption has to be rejected based on the insignificant prediction value of safety training ($\beta=-.02$). The proactive ability factor which comprised of a proactive personality scale, was weak and insignificant ($\beta=.06$) for the Malaysian participants. Proactive motivation (Can Do), which contains the RBSE scale proven to be the strongest and significant predictor for PSB ($\beta=.32$, $p<.01$). It means that the participants were expected to have higher proactive safety behavior when there is a capability to work beyond the standard organizational requirement is increased. Thus, I have accepted the full model $R^2$ that is significantly greater than zero, $F(4, 9) = 29.34$, $p < .001$ and the $R^2$ is accounted for 51.3%.  

Table 6.5

Convergent and Discriminant Validity for the Malaysian participants

<table>
<thead>
<tr>
<th>Factors</th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>R(H)</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proactive Ability</td>
<td>.80</td>
<td>.45</td>
<td>.19</td>
<td>.97</td>
<td>.67</td>
</tr>
<tr>
<td>Proactive Motivation (Can Do)</td>
<td>.89</td>
<td>.63</td>
<td>.34</td>
<td>.96</td>
<td>.80</td>
</tr>
<tr>
<td>Proactive Motivation (Reason To)</td>
<td>.90</td>
<td>.60</td>
<td>.36</td>
<td>.93</td>
<td>.78</td>
</tr>
<tr>
<td>Proactive Motivation (Energized To)</td>
<td>.73</td>
<td>.48</td>
<td>.11</td>
<td>.76</td>
<td>.69</td>
</tr>
<tr>
<td>Proactive Opportunity</td>
<td>.88</td>
<td>.71</td>
<td>.06</td>
<td>.97</td>
<td>.84</td>
</tr>
<tr>
<td>Proactive Safety Behavior (PSB)</td>
<td>.86</td>
<td>.61</td>
<td>.36</td>
<td>.98</td>
<td>.78</td>
</tr>
</tbody>
</table>

N=260, CR= Composite reliability, AVE= Average Variance Extracted, MSV=Maximum Shared Variance

Max R (H)= Maximum reliability, AC=Alpha Cronbach

In Table 6.5, the AVE value for proactive motivation (Energized To) was .48 and .45 for proactive ability, which was lower than .5. These values were not consistent with Hair et al. (2010). If the AVE value is lower than .5, there is a possibility for the items not to converge into a single construct. There is a remedial solution for this, which is to delete and replace an item from the factor, also known as The Jack-Knife Method (Efron, 1982). Though, since proactive motivation (Energized To) has only three questions, removing one will cause the factor to be incomplete and not consistent with the requirement of a minimum number of items per factor. However, in this case, because the CR for both factors was higher than .7, therefore we can accept the AVE value at less than .5, in line with Fornell & Larcker (1981), and the construct validity is deemed adequate.
The decision is made based on the CR value, was because CR measures unidimensionality, which relates to the adequacy of the items to explain the variable (Falissard, 1999; Slocum-Gori & Zumbo, 2011). MSV for all factors was lower than AVE. Therefore the latent factor was sufficient to explain the variable.

6.3.2 Australian sample

The result of the KMO Test Measure of Sampling for N=274 was .88 (meritorious), and Bartlett’s Test of Sphericity was significant at .000. Therefore, we can accept the hypothesis of a significant correlation between the population and the variables. These tests proved that the data are suitable for factor analysis.

The results of the EFA are now presented. The explained variance of 57.79 %, which means that the factors are sufficient to explain the model (Ellis, Voekl, & Morris, 1994), consistent with Gorsuch's (1988) suggested threshold of 40-50%. The scree plot (see Figure 6.4) demonstrates a sharp and constant decrease after 7, which suggests the optimal factor solution be seven factors.
Figure 6.4 Scree plot with Eigenvalue (Australian sample)
Table 6.6

Factor Loadings from the Exploratory Factor Analysis (Australian participants)

<table>
<thead>
<tr>
<th>Proactive safety behavior (Self-Determination Perspective)</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
<th>Factor 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think about ways to improve workplace safety</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I imagine different ways in which workplace safety can be</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>improved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think about how my tasks could be performed more safely</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I go through different scenarios in my head about how to</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>make changes to create a safer workplace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get myself into the right mood before trying to make a</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>change or put forward my suggestions for improving</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>workplace safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think carefully about how my ideas for improving</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>workplace safety can be implemented, before deciding how</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to act</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I initiate better ways of doing my core tasks more safely</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I come up with ways in which my core tasks are done more</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>safely</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I make changes to the way my core tasks are done to make</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>them safer to perform</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I make suggestions to improve the overall safety</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>effectiveness of the organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I involve myself in changes that are helping to improve</td>
<td>0.60</td>
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<td>the overall safety</td>
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<td>effectiveness of the organization</td>
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<td></td>
</tr>
<tr>
<td>I come up with ways of increasing safety efficiency</td>
<td>0.66</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>within the organization</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I monitor the effect of my attempts to change safety</td>
<td>0.65</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>behavior</td>
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<td></td>
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</tr>
<tr>
<td>I seek feedback from others regarding the effects of my</td>
<td>0.58</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>safety actions</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I try to learn from the safety actions that I am engaged</td>
<td>0.70</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>in for future reference</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Proactive Motivation 'Can Do'**

| Representing your work area in meetings with senior        | 0.62     |          |          |          |          |          |          |
| management                                                |          |          |          |          |          |          |          |
| Designing new procedures for your work area              | 0.76     |          |          |          |          |          |          |
| Analyzing a long-term problem to find a solution         | 0.81     |          |          |          |          |          |          |
| Making suggestions to management about ways to improve    | 0.75     |          |          |          |          |          |          |
| your work area                                            |          |          |          |          |          |          |          |
| Writing a proposal to spend money (in your work area)     | 0.64     |          |          |          |          |          |          |
| Helping to set targets/goals in your work area           | 0.57     |          |          |          |          |          |          |
| Contacting people outside your organization to discuss    | 0.61     |          |          |          |          |          |          |
| problems                                                  |          |          |          |          |          |          |          |
| Presenting information to a group of colleagues          | 0.62     |          |          |          |          |          |          |
| Waiting people from other departments to suggest doing    | 0.62     |          |          |          |          |          |          |
| things differently                                        |          |          |          |          |          |          |          |

**Proactive Opportunity**

| If necessary, can you ask your colleagues for help?       | 0.75     |          |          |          |          |          |          |
| Can you count on your colleagues to support you, if       |          |          |          |          |          |          |          |
| difficulties arise in your work?                         | 0.88     |          |          |          |          |          |          |
| In your work, do you feel valued by your colleagues?      | 0.62     |          |          |          |          |          |          |

**Proactive ability**

| If I see something I don't like, I fix it                 | 0.71     |          |          |          |          |          |          |
| No matter what the odds, if I believe in something, I     |          |          |          |          |          |          |          |
| will make it happen                                        | 0.88     |          |          |          |          |          |          |
| I love being a champion for my ideas, even against       |          |          |          |          |          |          |          |
| others' opposition                                        | 0.79     |          |          |          |          |          |          |
| If I believe in an idea, no obstacle will prevent me from|          |          |          |          |          |          |          |
| making it happen                                           | 0.49     |          |          |          |          |          |          |

**Proactive Motivation 'Energized to'**

| Inspired                                                  | 0.59     |          |          |          |          |          |          |
| Determined                                                | 0.74     |          |          |          |          |          |          |
| Active                                                    | 0.54     |          |          |          |          |          |          |

**Proactive Motivation 'Reason to'**

| Because I am supposed to do it                            | 0.76     |          |          |          |          |          |          |
| Because it is something that I have to do                | 0.76     |          |          |          |          |          |          |
| Because I don't have any choice                          | 0.55     |          |          |          |          |          |          |

**Proactive Safety Behaviour (Safety Citizenship Role Definition and Behavior)**

| Attending non-mandatory safety-oriented meetings          | 0.80     |          |          |          |          |          |          |
| Keeping informed of changes in safety policies and       |          |          |          |          |          |          |          |
| procedures                                              | 0.70     |          |          |          |          |          |          |
| Expressing opinions on safety matters even if others     |          |          |          |          |          |          |          |
| disagree                                                | 0.55     |          |          |          |          |          |          |
| Eigenvalues                                              | 10.79 4.47 2.81 2.11 1.72 1.43 1.37 |          |          |          |          |          |          |
| Explained Variance                                       | 26.63 10.27 6.09 4.34 3.24 2.54 2.43 |          |          |          |          |          |          |

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 6 iterations.
 Altogether, 40 items were extracted through EFA. Proactive safety behavior (Self-Determination Perspective) was the first factor loaded with 15 out of 16 questions. Unlike the finding from the Malaysian participants, proactive safety behavior (Safety Citizenship Role Definition and Behavior) was loaded as the last or 7th factor with only three items. Similar to the analysis for the Malaysian participants, proactive safety behavior (Safety Citizenship Role Definition and Behavior) variable is not included in the CFA. It is important to note here that the focal point of this research is to examine a model that includes proactive safety behavior (Self-Determination Perspective) only. As being mentioned before, the main reason to incorporate proactive safety behavior (Safety Citizenship Role Definition and Behavior) in the EFA is to observe if it differs from proactive safety behavior (Self-Determination Perspective) (see Hair et al., 2010). The EFA findings indicated that the factors are distributed into two different variables and proven that they are built from a different theoretical perspective. Proactive motivation (Energized To) was the 5th factor elicited with all positive items as compared to all three negative items obtained from the Malaysian participants' EFA analysis. Proactive safety behavior (Self-Determination Perspective) accounted for 26.63% explained variance while proactive safety behavior (Safety Citizenship Role Definition and Behavior) accounted for only 2.43%. Overall, the EFA findings were satisfactory.
Figure 6.5  Measurement model for proactive safety behavior for the Australian participants

Figure 6.5 demonstrates the CFA finding for the Australian participants. After a few times of model improvement through modification indices to eliminate factors with lower values than the

$\chi^2$/df=1.89  
CFI=.93  
SRMR=.06  
RMSEA=.06  
PClose .10
threshold, there were six factors with 22 items retained and proven to have a model fit with $\chi^2/df=1.89$, CFI=.93, SRMR=.06, RMSEA=.06 and P-close .10. The goodness of fit model was satisfactory and consistent with Hu & Bentler's (1999) indices.

Table 6.7 displays the correlation between the factors. I examined the correlation table for the Australian participants and scrutinizing any highly correlated factors. Proactive safety behavior was weakly correlated with safety training ($r=.40$) and also proactive ability ($r=-.034$). There was an inverse relationship between proactive motivation (Energized To) with proactive motivation (Reason To) ($r=-.27$), meaning that a high activation positive state will decrease the young worker's situational motivation. There was a weak correlation between proactive motivation (Can Do) with proactive motivation (Energized To) ($r=.48$), which can be explained by an increase in the high activation positive state will also increase confidence in performing job beyond the normal requirement. Proactive opportunity was significantly correlated with proactive motivation (Energized To) ($r=-.29$) can be interpreted as an increment in workplace support that will reduce the high activation positive state of a person. Overall, because none of the factors were highly correlated, therefore, all were retained.
Table 6.7:

Means, Standard Deviations, control variables, and Inter-correlations among Study Variables for the Australian participants

| Variables                  | N  | Mean | S.D | 1  | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|----------------------------|----|------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Age                     | 274| 19.81| 2.74|    |     |     |     |     |     |     |     |     |     |     |
| 2. Gender                  | 274| 1.54 | .51 | .03|    |     |     |     |     |     |     |     |     |     |
| 3. Job tenure              | 274| 1.56 | .76 | .40**| -0.05|   |     |     |     |     |     |     |     |     |
| 4. Safety training         | 274| 2.22 | 1.23|.17**| -0.04| .27**|   |     |     |     |     |     |     |     |
| 5. Proactive Ability       | 274| 4.97 | .95 | -0.03| -0.13*| .10 | .19**| (.69)|     |     |     |     |     |     |
| 6. Proactive Motivation Can Do | 274| 4.36 | .90 | .02 | .05 | .08 | .07 | .19**| (.67)|     |     |     |     |     |
| 7. Proactive Motivation Reason To | 274| 3.67 | 1.33| .01 | -0.02| -0.01| -0.09| -0.07| .19**| (.71)|     |     |     |     |
| 8. Proactive Motivation Energized To | 274| 3.26 | .89 | .06 | -0.03| .15*| .13*| .25**| .48**| -0.27**| (.74)|     |     |     |
| 9. Proactive Opportunity   | 274| 3.60 | .93 | -11 | -11 | .06 | .02 | .04 | .17**| -0.18**| .29**| (.79)|     |     |
| 10. Proactive Safety Behavior | 274| 2.61 | .89 | .15*| .02 | .08 | .40**| .34**| .28**| .06 | .26**| .03 | (.77)|     |

* Note: Internal consistency reliabilities appear in parentheses along the diagonal.

* Correlation is significant at p ≤ .005  **Correlation is significant at p ≤ .001
Next, I performed a stepwise multiple regression to predict proactive safety behavior, the results of which are summarised in Table 6.8. In Step 1, I entered only the demographic variables. In this step, only safety training (β=.40) has a positive and significant relationship to proactive safety behavior. The model in Step 1 accounted for 18% of the total variance. Next, in step 2, all predictors were entered simultaneously. Proactive ability was a strong positive predictor of proactive safety behavior (β=.25), while proactive opportunity (β=.01) or workplace support was not a significant predictor of proactive safety behavior. The model was improved when all the variables were included. The full model was accepted, $R^2$ is significantly greater than zero, $F(4, 9) = 13.42, p < .01$, and the overall variance accounted for was 32%.
Table 6.8

Results of regression analysis predicting proactive safety behavior (PSB) – Australian Sample

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>β</td>
</tr>
<tr>
<td>Gender</td>
<td>.11</td>
<td>.14**</td>
</tr>
<tr>
<td>Age</td>
<td>.03</td>
<td>.05</td>
</tr>
<tr>
<td>Safety Training</td>
<td>.40**</td>
<td>.35**</td>
</tr>
<tr>
<td>Job Tenure</td>
<td>-.07</td>
<td>-.13</td>
</tr>
<tr>
<td>Proactive Ability</td>
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<td>.25**</td>
</tr>
<tr>
<td>Proactive Motivation Can Do</td>
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<td>.13*</td>
</tr>
<tr>
<td>Proactive Motivation Reason To</td>
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<td>.13*</td>
</tr>
<tr>
<td>Proactive Motivation Energized To</td>
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<td>.13*</td>
</tr>
<tr>
<td>Proactive Opportunity</td>
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<td>.01</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.18*</td>
<td>.14*</td>
</tr>
<tr>
<td>ΔF²</td>
<td>14.15</td>
<td>10.77</td>
</tr>
<tr>
<td>d.f</td>
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<td>9</td>
</tr>
<tr>
<td>Total R²</td>
<td>.18</td>
<td>.32</td>
</tr>
<tr>
<td>F</td>
<td>14.15**</td>
<td>13.42**</td>
</tr>
</tbody>
</table>

N=274. * Coefficient is significant at p ≤ .05  **Coefficient is significant at p ≤ .01
**Table 6.9**  
*Convergent and Discriminant Validity for the Australian participants*

<table>
<thead>
<tr>
<th>Factors</th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>R(H)</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proactive Ability</td>
<td>.73</td>
<td>.48</td>
<td>.15</td>
<td>.97</td>
<td>.69</td>
</tr>
<tr>
<td>Proactive Motivation (Can Do)</td>
<td>.77</td>
<td>.45</td>
<td>.15</td>
<td>.95</td>
<td>.67</td>
</tr>
<tr>
<td>Proactive Motivation (Reason To)</td>
<td>.75</td>
<td>.50</td>
<td>.10</td>
<td>.97</td>
<td>.71</td>
</tr>
<tr>
<td>Proactive Motivation (Energized To)</td>
<td>.78</td>
<td>.55</td>
<td>.14</td>
<td>.83</td>
<td>.74</td>
</tr>
<tr>
<td>Proactive Opportunity</td>
<td>.83</td>
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<td>.07</td>
<td>.97</td>
<td>.79</td>
</tr>
<tr>
<td>Proactive Safety Behavior (PSB)</td>
<td>.90</td>
<td>.60</td>
<td>.15</td>
<td>.94</td>
<td>.77</td>
</tr>
</tbody>
</table>

N=274, CR= Composite reliability, AVE= Average Variance Extracted, MSV=Maximum Shared Variance  

Max R(H)= Maximum reliability, AC=Alpha Cronbach

There were three factors from the Australian sample’s findings with AVE values <.5. It indicated the possibility of low convergent validity. As explained earlier, the CR value must be examined to determine whether the items are convergent and shared variance only with their parent factor. The CR value for the factors were more than .7. Therefore, we can argue that they were unidimensional. Hence, the items can explain the variables.
6.4 Discussion

6.4.1 Malaysian sample findings

There were six items used to measure proactive personality. However, only five items were captured in the EFA. One item was dropped because its loading was less than .45; ‘I excel at identifying opportunities’. However, given the findings of the linear regression, it is identified that proactive ability (Proactive Personality) did not predict proactive safety behavior. Although Proactive Personality is known to be the strongest predictor to proactive behavior (Belschak & Den Hartog, 2010; Kong & Li, 2018; N. Li, Liang, & Crant, 2010), however, personality is seen to be a distal predictor of safety behavior, according to models of safety behavior (Griffin et al., 2007; Hu et al., 2018; Jiang, Yu, Li, & Li, 2010). Therefore, this finding supports the role of personality in the model of safety behavior identified by Griffin et al. (2007). Another construct of proactive ability in this research was the locus of control (LoC). However, after iteration during EFA, none of the items were captured and able to be included in the proactive ability construct. This is caused by the cross-loadings across the factors with less than .45. Therefore, it is concluded that locus of control is not suitable for this research model and must be eliminated from the framework and future analysis.

Nine items represent proactive motivation (Can Do). However, there were four items were dropped in the EFA; ‘Making suggestions to management about ways to improve your work are,’ ‘Helping to set target /goals in your work area,’ ‘Contacting people outside your organization to discuss problems’ and ‘Visiting people from other departments to suggest doing things differently’ due to an insufficient factor loading. The findings demonstrated that the young Malaysian workers have the confidence to propose changes in safety-related work only to the colleagues but not to the management or other people outside the organization. This is consistent with the research on young workers and workplace safety, where young people are not confident to take charge of expressing
an opinion about workplace safety to the management (Tucker & Turner, 2015, 2017). However, Proactive Motivation (Can Do) is the strongest predictor of proactive safety behavior, based on the regression analyses.

Proactive motivation (Reason To) is associated with the motivational component that can drive the young workers to engage in proactive safety behavior. All six components that have enough factor loadings from the EFA are associated with intrinsic motivation and identified regulation, which is closer to the self-determination component. The findings indicated that the drive to engage in proactive safety behavior among young workers is mostly internalized. The findings are consistent with previous research on proactive safety behavior (Curcuruto, Conchie, Mariani, & Violante, 2015; Matteo Curcuruto & Griffin, 2016).

Proactive Motivation (Energized To) is related to affective states of a person, be it positive or negative. ‘Nervous,’ ‘Afraid,’ and ‘Upset’ are the negative state of the young workers that eventually drove them to engage in proactive safety behavior. Although many of previous research on proactive behavior are connected through the positive affective pathway (Bakker et al., 2011; Bindl et al., 2012; Costa & McCrae, 1980), there are also studies pointed out the importance of negative affective in proactivity (Brosi et al., 2018; Wolsink et al., 2019). Therefore, the finding of this research is consistent with the pathway that recommended proactive safety behavior among the young workers are associated with the negative affective and not positive affective pathway.

There were nine items in proactive opportunity; however, only three appeared to carry enough factor loading and have no cross-loadings with other factors. Social support seemed to be a significant predictor of proactive safety behavior. In other words, the proactive safety behavior engagement among the young workers is determined by the support from the leader and the co-workers. This is consistent with research on proactive safety behavior that argued the importance of
social norms such as persuasion and encouragement by the leader and the co-workers and its influence on the employees' behavioral engagement (Fugas et al., 2011, 2012).

The EFA extraction for proactive safety behavior was able to obtain only four items that are associated with envisioning and planning. For envisioning, the items were; ‘I think about ways to improve workplace safety’ and ‘I think about how my tasks could be performed more safely. For planning, the items were ‘ I go through different scenarios in my head about how to make changes to create a safer workplace’ and ‘I think carefully about how my ideas for improving workplace safety can be implemented before deciding how to act.’ In proactive safety behavior, envisioning and planning are related to the cognitive part that is internalized and cannot be observed (Montani et al., 2014). Therefore, the proactive safety behavior among young Malaysian workers is much significant only at the beginning stage in the process of proactive safety behavior that took place within the young workers themselves.

The demographic information appeared to be the least significant predictor of proactive safety behavior except for gender and job tenure. Gender differences in proactive safety behavior engagement are translated into a substantial difference between male and female young workers in proactive safety behavior. This finding supported the previous research on safety behavior that suggested the young female workers are more active in voicing out concern over unsafe conditions at the workplace as compared to young male employees (Tucker & Turner, 2013, 2015). Previous research on safety behavior also argued that job tenure would influence safety behavior (Haas et al., 2019), which I found consistent with this research finding.
6.4.2 **Australian sample findings**

As mentioned earlier, Proactive Personality is proposed as a construct of proactive ability alongside locus of control. From six items of Proactive Personality, only four items were captured in EFA while the other two, ‘I am always looking for better ways to do things’ and ‘I excel at identifying opportunities’, were dropped due to insufficient factor loadings. However, unlike the Malaysian sample, proactive personality is identified as a significant predictor of proactive safety behavior. Hence the finding of the Australian participant supported the previous studies on the relationship between proactive personality and proactive behavior (Bryan, Marler, & Hester, 2012; Lau, Wong, & Chow, 2013). Like the Malaysian sample, locus of control is not extracted either as part of proactive ability or as another factor. Locus of control suffered similar situations like the Malaysian sample, where all the items are cross-loaded and have factor loadings lower than .45. Therefore, it can be concluded that locus of control is not compatible with the research framework either for the Malaysian or the Australian sample.

All items of proactive motivation (Can Do) for the Australian participants are significant and loaded more than .45. The findings demonstrated that the young Australian workers have the confidence to analyze the problems that arose in the organization and actively participating in the improvement process across at all levels, either with the colleagues, the management, or even the individuals outside of their organization. However, the most apparent item is ‘Analyzing a long-term problem to find a solution.’ This relates to the young Australians observation of the significant problems in workplace safety that took place in the organization for quite some time and yet to be resolved. The finding is consistent with previous research that noted the young workers’ capabilities in understanding safety problems and continuously making suggestions to improve the situation (Barling, Loughlin, & Kelloway, 2002; Tolentino et al., 2014).
For proactive motivation (Reason To), the young Australian workers are externally motivated to engage in proactive safety behavior. The proactive safety behavior among the young Australian workers are mostly non-self determined and is highly influenced by the external force. This is consistent with the conformity element of safety motivation, where the young workers practiced proactive safety behavior to follow tradition for security (Bergheim et al., 2013; Hystad & Bye, 2013). The research findings are contradicting to the proactive motivation (Reason To) of the young Malaysian employees, which recorded at the self-determined perspective.

I found a striking difference in findings of proactive motivation (Energized To) between the Malaysian and Australian participants. The Malaysian sample is motivated by the negative affective, but the Australian participants are driven by only the positive affective. The highest factor loading is recorded by ‘Determined’ with .84. The result represented that the young Australian workers are in high positive affective status determined their engagement in proactive safety behavior and the finding supported previous research on affective and safety (see Belschak & Hartog, 2010; Hengartner, Graf, & Schreiber, 2017; van den Heuvel, Demerouti, & Peeters, 2015). In a similar vein, it is interesting to note here that all proactive motivation components are significant predictors to proactive safety behavior with $\beta=.13$ each.

There was a consistency between the findings of proactive opportunity between the Malaysian and Australian samples. Social support items seem to be significant predictors to proactive safety behavior and extracted from the EFA both for Malaysian and Australian samples. The finding revealed that the young workers from both samples are relying on the leaders and co-workers’ support to engage in proactive safety behavior. Constant recognition, acknowledgment, and motivation are perceived as the most important mechanism to initiate and maintain proactive safety behavior (see Hofmann & Morgeson, 1999; Turner, Stride, Carter, McCaughey, & Carroll, 2012).
The EFA from the Australian sample provided an interesting discovery for this research. Unlike the Malaysian sample, all the items in proactive safety behavior were extracted and have a satisfactory factor loading. It can be argued that all underlying items are interrelated among measure variables of proactive safety behavior.

Like the Malaysian sample, gender has a significant role in predicting proactive safety behavior. The finding supported previous research in determining the gender differences in proactive safety behavior. Therefore, based on both samples, I have to argue that male and female young employees differ in proactive safety behavior. Another demographic variable that has significant predictive power to proactive safety behavior is safety training. For the Malaysian sample, safety training is not a strong or significant predictor, but on the Australian sample, safety training has a greater role in controlling proactive safety behavior. Consequently, the findings supported previous studies on the importance of safety training and safety behavior (Ford & Stephens, 2018; Howell, Brown, & Atkins, 1990; Lewko, Runyan, Tremblay, Staley, & Volpe, 2010).

**6.4.3 General discussion**

The overarching objective of this study was to identify the most salient factors while providing a parsimonious and valid model of proactive safety behavior. Overall, the objectives were addressed. The model similarities between the Australian and the Malaysian were accomplished. Hence, the questionnaires are valid to be used and tested for Study Three. One method to determine equivalence in cross-cultural research is by comparing models between multi-group and populations (Milfont & Fischer, 2010). The validity can be estimated by examining the model's goodness of fit (Brown, Harris, O'Quin, & Lane, 2017; Watkins, 1989), and whether the findings were found adequate and satisfactory. Also, another way of determining the equivalence is by looking at the
uni-dimensionality across the samples. If the internal reliability analysis is adequate, then equivalence is accomplished (Claes, Van Loo, Wahl, & Hans-Werner, 2011).

Table 6.10

*CFA Model comparison of the Malaysian and the Australian participants based on Hu & Bentler (1999) Goodness of fit indices*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Threshold value</th>
<th>Malaysian Participants</th>
<th>Australian Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square/df (CMINdf)</td>
<td>&lt;3 good</td>
<td>1.53</td>
<td>1.89</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt;.95 great; &gt;.90 acceptable</td>
<td>.96</td>
<td>.93</td>
</tr>
<tr>
<td>SRMR</td>
<td>&lt;.09</td>
<td>.05</td>
<td>.062</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt;.05 good; .05-.10 moderate; &gt;.10 bad</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>PCLOSE</td>
<td>&gt;.05</td>
<td>.88</td>
<td>.10</td>
</tr>
</tbody>
</table>

The cut-off point for the factor loading is .45. There were two factors related to proactive safety behavior; proactive safety behavior (Safety Citizenship Role Definition and Behavior) and proactive safety behavior (Self-Determination Perspective) demonstrated in both populations. The main reason for proactive safety behavior (Safety Citizenship Role Definition and Behavior) variable included in this study was to make a distinction against proactive safety behavior (Self-Determination Perspective). Although both factors were operationalized as ‘proactive,’ they were built from a different theoretical perspective. As explained in Chapter Three, proactive safety behavior (Safety Citizenship Role Definition and Behavior) approach was derived from an organizational citizenship behavior, while proactive safety behavior (Self-Determination Perspective) is a process of changing the way of doing work for proactive goal achievement. The findings indicated that both variables were distributed to different factors therefore proven to be distinct from each other.
One prominent finding that should be discussed here regards the relationship between safety training and proactive ability with proactive safety behavior. Although safety training is known to be a predictor of safety behavior (see Burke et al., 2006; Cooper & Phillips, 2004; Vinodkumar & Bhasi, 2010), the finding differed between Malaysia and the Australian participants. The results from the Malaysian participants indicated a non-significant relationship between safety training and proactive ability with proactive safety behavior, while the findings from the Australian participants were significant. Malaysia is an upper-middle-income economy developing country, with Gross National Income (GNI) per capita between USD3956 to (Bank, 2016; Tong et al., 2017). Like many other developing countries, Malaysia is still striving to achieve and preserve safety standards towards safety behavior (Hassam & Mahamad, 2012; Ismail, Ahmad, Ismail, & Janipha, 2012; Yulita et al., 2017). There are two underpinning and related issues behind this problem; safety policy and safety training. Malaysian workplace safety is still overseen by the Ministry of Human Resources (MOHR) under the National Council for Occupational Safety and Health (NCOSH), and the most significant governing law is The Occupational Safety and Health Act 1994 (DOSH, 2011; Rogério dos Santos Alves; Alex Soares de Souza, 2014). NCOSH Malaysia is a tripartite platform for the workers and employers and also facilitating government policy and implementation (Clark, 1999; Rozali, Khairuddin, Sherina, Zin, & Sulaiman, 2008; Sirat, Shaharoun, Abdul, & Syed, 2011). However, the situation is dissimilar to Australia. Currently, Australia’s workplace safety is governed by Safe Work Australia in 2005, replacing the previous National Occupational Health and Safety Commission (NOHSC) of Australia, which held a similar role as NCOSH in Malaysia. Safe Work Australia is a statutory body which has been entrusted with developing and evaluating national policies and strategies on work, health and safety (WHS) as well as the employers’ compensation (https://www.safeworkaustralia.gov.au). The Safe Work differs from the previous NOHSC because it is an outcome-based attainment body towards a healthy, safe and productive working life for those working in Australia (Coenen, Gilson, Healy, Dunstan, & Straker, 2017; Safe Work Australia, 2012). Under Safe Work, training programs are initiated not only to raise
awareness but also to teach the employees to find a new way of doing work and also to improve the workplace safety (Baum, 2000; Wilson, Stemp, & McGinty, 2011). Safety training under Safe Work Australia has proven to be more inclusive and engaging that it emphasizes on skill-building and thinking abilities towards a safer working environment (Beaton, Krishnasamy, Toussaint, Phoon, & Gray, 2017; Joss, Dupré-Husser, Cooklin, & Oldenburg, 2017). It did not rely on the cognitive level educational program but infused safety skill development programs (Laberge, MacEachen, & Calvet, 2014; Lund & Marriott, 2011). Hence, this is the reason for a strong significant prediction power of safety training and proactive ability towards proactive safety behavior among the Australian participants. Although safety training in Malaysia is mandatory (Abdullah Sani & Siow, 2014; Ali et al., 2009), however, it is often ignored (Idayu, Anis, Akmal, & Esa, 2014) due to lack of awareness (Abdullah Sani & Siow, 2014; Lani & Hassan, 2017; Shamsuddin, Ani, Ismail, & Ibrahim, 2015) and financial constraints (Khoo, Surienty, & Hung, 2011; Subramaniam et al., 2016). The solution to this problem is the government’s active role to uphold safety policy at the national level (Lani & Hassan, 2017) similar to what has been done by the Australian government. Not until in 2010, has the Malaysian government launched Occupational Safety and Health Master Plan for Malaysia 2015 (Ministry of Human Resources, 2008), a safety policy that is goal-directed and self-regulated to overcome workplace accidents and injuries. According to this plan, by 2015, the stakeholders (employers and employees) will be fully equipped with self-regulated workplace preventive behavior through safety training and other initiatives, however, the finding from this study (Study Two) proven to be conflicting. Therefore, a detailed policy analysis should be conducted to see its content and effectiveness.

For proactive motivation (Energized To), the participants’ proactive safety behavior engagement was measured by examining the role of positive and negative affect. For the Malaysian participants, only three items were retained and extracted. The items were ‘Nervous,’ ‘Afraid,’ and
‘Upset,’ which were the Negative Affect (NA), from Thompson (2007) PANAS scale. The emergence of 3 negative items with satisfactory factor loadings during EFA has made me review the reverse coding in SPSS. I assumed that the negative items were not reverse coded, thus they were reflected as the most reliable items in one factor. However, after some reviews, all negative items were proven to be reverse coded. Therefore the negative items were retained.

There was an entirely different finding regarding proactive motivation (Energized To) gathered from the Australian participants. All three items extracted from EFA were positive namely ‘Inspired,’ ‘Determined,’ and ‘Active’ and fitted the model in CFA. Although the findings from both populations were at the extreme point, however, both proven to be a motivational pathway towards proactive safety behavior. In Study One that was conducted explicitly on the Malaysian participants, the preliminary findings indicated a similar situation. Study One was a qualitative study of in-depth interviews with 33 young employees aged between 18-28 years old. During the interviews, the interviewees did mention the importance of proactive safety behavior. One of many reasons was the fear of having not to be able to work due to workplace injuries or accidents. That fear then motivated them to take extra precautions at work that led them to engage in proactive safety behavior. This finding is consistent with previous research that negative affect of a person could drive them to a more systematic behavior towards goal attainment (Fodor & Pintea, 2017) and stimulated creativity that can help them to work for a positive future (Forgas, 2017; Kwaśniewska, Gralewski, Witkowska, Kostrzewska, & Lebuda, 2017).

Another finding worth discussing that was extracted from the analysis for the Malaysian and the Australian participants were the locus of control variable. During EFA, locus of control items was recorded among items with the lowest factor loadings and the highest cross-loadings across
factors. Initially, I integrated a Proactive Personality with the locus of control variable for Proactive Ability variables. However, the attempts to integrate these two variables into a factor were unsuccessful. After multiple iterations, all locus of control items were omitted because it did not group with Proactive Personality items. This finding is consistent with previous research on proactive personality which indicated a distinction between proactive personality and locus of control (see Bateman & Crant, 1993, 1999; Crant, 2000).

6.5 Conclusion

Overall, this study is successful in identifying the parsimonious model for both samples. These items were successfully extracted for each variable with satisfactory factor loadings. The findings supported the research framework proposed at the beginning of the chapter. Therefore, it is feasible to say that the research is successful and can be in support of developing Study Three. Although some of the predictions regarding the relationship between the predictors and the independent variables are not supported, such as the influence of proactive personality to proactive safety behavior for the Malaysian sample, there was a revelation of consistency between the influence of proactive motivation (Can Do) for both the Malaysian and the Australian sample. Furthermore, this study has proven that there was a significant difference between proactive safety behavior (Safety Citizenship Role Definition and Behavior) and proactive safety behavior (Self-Determination Perspective). Additionally, this study has provided a preliminary finding of a possible relationship between proactive ability, proactive motivation and proactive opportunity with proactive safety behavior, which will be tested further in Study Three.

However, this research has its limitations. This is cross-sectional research, in that the data collection is conducted at only one point of time. Cross-sectional research is not advisable for
behavioral research, given the probability of exposing the findings to common research bias. However, because the research interest is not towards understanding the magnitude of relationship but merely looking at the best parsimonious model with the sufficient number of items with specific factor loading, this research design is acceptable (Lee & Lee, 2015; Yamin, Salim, Setiati, Alwi, & Zulmiyusrini, 2019).
Chapter 7

Study 3: Identifying Antecedents of Proactive Safety Behavior of Young Workers

7.1 Introduction

The purpose of Chapter 7 is to present the findings of a longitudinal study examining the influence of proactive ability, proactive motivation, and proactive opportunity on proactive safety behavior in young Malaysian workers. The conceptual framework underlying the study is presented in Figure 7.1. This research attempts to test the hypotheses underlined in Chapter Four. The framework is similar to the one proposed in Chapter Four but includes work engagement as a hypothesized intervening variable. This study is also to answer research question 1; to see whether work engagement is a significant predictor to determine proactive safety behaviour, alongside proactive ability, proactive motivation and proactive opportunity.

Work engagement, taken from a positive psychology perspective is constituted by three components: dedication, vigor and absorption (Bakker et al., 2011), and has proven to be a significant variable in organizational research, with studies finding relationships to outcomes such as work stress (Bakker et al., 2011; Karatepe, Yavas, Babakus, & Deitz, 2018), proactive behavior (Caniëls et al., 2018; Schmitt et al., 2016) and employee performance (Aybas & Acar, 2017; Marisa Salanova, Agut, & Peiró, 2005). Research indicates that work engagement, an employees’ positive state of mind at work, has positive impacts on both individual-level performance and organizational level performance (Rook et al., 2018). Employees are believed to be more productive and resourceful in overcoming difficulties arisen at work if they are engaged in their work (Ward et al., 2014) and at the same time, achieving the organizational objectives.
Work engagement is believed to influence positive behavioural outcomes among employees (Salanova, Agut, & Peiró, 2005), including innovative behavior Demerouti, Bakker, Jonge, Jassen, & Schaufeli (2001). Highly engaged individuals are inclined to pursue a sense of challenge and immerse themselves in work and also enthusiastically to look for, promote, and accomplish new and creative ideas (Parker, Wang, & Liao, 2019). It has also been found that proactive employees are more likely to craft their jobs and be active in promoting new thoughts on how to improve their job (Tims, Bakker, and Derks, 2012).

While not originally included as a variable within the original research framework of this thesis, it is conceivable that work engagement might, as a proximal outcome of proactive ability, motivation, and opportunity, mediate the relationship between these variables and the dependent variable, proactive safety behavior. Proactive ability, motivation, and opportunity are three components of a combination of individual differences and external factors that are believed to be affecting and stimulating the young workers' cognitive, psychological, and physical at work. The process of work engagement starts with harnessing the young workers' cognitive and psychological engagement to their work and, eventually, exerting effort to engage in proactive safety behavior. Work engagement is hypothesized to be mediating the relationship between proactive ability, motivation, and opportunity and proactive safety behavior based on the argument that an employee will be more inclined to engage in proactive safety behavior when they are feeling enthusiastic, energized, and happy with their work. Therefore, the mediating relationship is worth studying, and possible fruitful outcomes can be expected.
For this study, I adopted a two-wave longitudinal survey research design, using repeated measures. Longitudinal data collection is highly recommended as a means of controlling for potential Common Method Bias (CMB; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) that arises with single-source survey-based data. The principle of longitudinal analysis in behavioral research highlights the importance of testing predictors and outcomes in a different time point to identify the development of behavior (Abbott & Bordens, 2011; D. Miller & Friesen, 1982) which cannot readily be established through a cross-sectional survey design (Podsakoff & Organ, 1986). In this instance, data were collected from participants at two points in time, spaced six weeks apart.
7.2.2 Participants and Procedure

Survey data were collected through an online research company, Vase Technologies. Vase Technologies is an online market research company that has extensive experience in conducting surveys in Malaysia and Singapore. At the beginning of the study, I contacted Vase Technologies and expressed my intention to look for participants based on the inclusion criteria; age between 18-28 years old and currently employed. Vase Technologies owns a database with 700,000 potential participants available for surveys. However, for this research, the participants were screened to fit the criteria. The survey was developed through UWA Qualtrics and then shared with Vase Technologies before dissemination through their online portal.

The first wave of this longitudinal data collection was conducted on 4 July 2017, with 370 valid responses available after data cleansing. The second wave commenced six weeks later, with 215 valid responses gathered. A six weeks interval was chosen between data collection for Time 1 and Time 2 as this is suggested as the minimum time required to see and compare differences in human behavior (Bakker et al., 2011; Hirschi et al., 2013; Sheldon & Gunz, 2009).

7.2.3 Measures

The measures for this study were similar to those used in Study 2, although the item content for the measures varied slightly as a result of subsequent factor analyses, described later in this chapter. As with Study 2, the demographic measures were age, gender, level of education, job tenure, and safety training.
**Proactive ability.** Four items from the Proactive Personality Scale by Bateman & Crant (1993) were used to measure proactive ability: ‘No matter what the odds, if I believe in something I will make it happen,’ ‘I am always looking for better ways to do things,’ ‘If I believe in an idea, no obstacle will prevent me from making it happen’ and ‘If I see something I don’t like; I fix it.’ The resultant reliability was acceptable, with Cronbach’s $\alpha=.83$.

**Proactive motivation (Can do).** Four items from the Role Breadth Self-Efficacy scale developed by Parker (1998) were used to measure proactive motivation (Can do): ‘Designing new procedures for your work area,’ ‘Writing a proposal to spend money (in your work area),’ ‘Presenting information to a group of colleagues,’ and ‘Making suggestions to management about ways to improve your work area.’ Specifically, the scale was selected to investigate the young worker’s capability and adaptability to change their daily job routines for safety. Cronbach’s alpha for reliability was found to be acceptable ($\alpha=.83$).

**Proactive motivation (Reason to).** Four questions were extracted from the Situational Motivation Scale (SIMS) by Guay, Vallerand, & Blanchard, (2000) to assess the rational bases of proactive motivation: ‘Because I am doing it for my good,’ ‘Because this work is fun,’ ‘Because I feel good when doing this work’ and ‘Because I believe that this work is important to me-,’ with the resultant Cronbach’s $\alpha=.87$.

**Proactive motivation (Energized to).** This was measured using the Positive Affective and Negative Affective Scale (PANAS) (Thompson, 2007). The statement was ‘Thinking about yourself and how you normally feel while at work, to what extent do you generally feel?’ Three negative affective elements were identified as ‘Upset,’ ‘Nervous,’ and ‘Afraid.’ Cronbach’s alpha for this variable was verified at $\alpha=.75$. 
Proactive opportunity. Three items were extracted from the ‘Autonomy’ sub-scale of the Job Demands-Resources questionnaire (Bakker et al., 2011). The items were: ‘Do you have flexibility in the execution of your work?’ , ‘Do you have control over how your work is carried out?’ and ‘Can you participate in decision-making regarding your work?’ with Cronbach’s alpha =.85.

Composite Proactive AMO. A composite multiplicative measure reflecting the potential interaction of proactive ability-motivation-opportunity was developed by multiplying the scores on each of the three variables together using the formula p=(AxMxO).

Proactive safety behavior. Seven items were selected to measure this variable: ‘I think about ways to improve workplace safety,’ ‘I imagine different ways in which workplace safety can be improved,’ ‘I think carefully about how my ideas for improving workplace safety can be implemented, before deciding how to act,’ ‘I initiate better ways of doing my core tasks more safely,’ ‘I make changes to the way my core tasks are done to make them safer to perform,’ ‘I make suggestions to improve the overall safety effectiveness of the organization’ and ‘I come up with ways of increasing safety efficiency within the organization.’ Three of these items were modified from the work-related proactive goal regulation developed by Bindl, Parker, Totterdell, & Hagger-johnson (2012), and four items on individual task proactivity were adapted from (Griffin, Neal, Parker, Griffin, & Parker, 2007b). The resultant measure’s reliability was acceptable (α=.94).

Work Engagement. Work engagement is a positive state of mind experienced by employees at work (Hakanen & Schaufeli, 2012; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012). In
organizational and industrial psychology, this topic has received considerable attention, having been identified as an important precursor to organizational performance and employee well-being (Bargagliotti, 2012; Demerouti et al., 2001). In this study, work engagement was measured using seven items taken from Utrecht Work Engagement Scale–9 [UWES-9] by (Schaufeli & Bakker, 2004): ‘At my work, I feel bursting with energy,’ ‘At my job, I feel strong and vigorous,’ ‘My job inspires me,’ ‘When I get up in the morning, I feel like going to work,’ ‘I feel happy when I am working intensely,’ ‘I am proud of the work that I do,’ ‘I am immersed in my work.’ Cronbach’s alpha was found to be α=.93.

_Socially Desirable Responding_. A five-item Social Desirable Response Set (SDRS-5) measure (Hays, Hayashi, & Stewart, 1989) was used to control for common method variance (CMV) and included at the end of the survey. The inclusion of such a measure in analyses involving single source survey data is recommended as a remedy for common method bias (see Crant, 1995; Kolarcik, Geckova, Orosova, van Dijk, & Reijneveld, 2009; Lewinsohn, Gotlib, & Seeley, 1997).

7.2.4 Data Analysis

The first step in the data analysis involved data cleansing, and both exploratory and confirmatory factor analyses were used to refine the item content for each of the measures before examining descriptive statistics and correlation matrices. Subsequently, I used hierarchical linear multiple regression and structural equation modeling to test the hypothesized model. Three types of software were used for the analysis: Statistical Package for Social Sciences Version 20, AMOS-Structural Equation Modelling (SEM) and MPlus.
Data cleansing. All incomplete answers were deleted, leaving only 215 applicable responses for which data were available at both Time 1 and Time 2. After that, I conducted a Common Latent Factor (CLF) analysis using SDRS-5 as a marker variable via AMOS-SEM, to control for bias due to socially desirable responding. This analysis is similar to doing a confirmatory factor analysis by co-varying SDRS-5 with the research variables. However, one important step that needs to be conducted before CLF analysis is to determine if the observed variables are either uncorrelated or weakly correlated to the marker variable (Tehseen, Ramayah, & Sajilan, 2017). This analysis involved adding a regression line between CLF and every observed item in the variable. However, the regression line must be equally constrained (Lindell & Whitney, 2001). In the first step, the analysis needs to be conducted without the marker variable. In the second step, the marker variable is added and covaried with research variables, as illustrated in Figure 7.2.
F1=Factor 1, F2= Factor 2, MV=Marker Variable

*Figure 7.2* Analysis with marker variable

*Factor analyses.* Next, I performed the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) for item identification and model testing. EFA is functional as an analysis that explains the factor structure (Yang & Xia, 2015), while CFA is imperative for measurement validity and reliability testing (Albrecht, Breidahl, & Marty, 2018). The CFA was conducted with AMOS-SEM. First, I analyzed the data with EFA. This is an important step to extract the optimum number of factors and items for this research. The result of the EFA has indicated that seven factors were successfully extracted, and the details of items representing each factor were explained at the beginning of this chapter. Subsequently, I ran CFA with AMOS SEM to verify the factor structure. The findings of CFA as deliberated in the Result section.
Hierarchical multiple linear regression (HMLR). HMLR was used to examine the effect of predictors (independent variables) on the dependent variable (Lindenberger & Pötter, 1998; Wang, Wright, Buswell, & Brownlee, 2013). HMLR is an ideal analysis to control for the effect of variables in a model which, if not accounted for, can cause a threat to internal validity (Petrocelli, Cohen, & Wampold, 2003; Schneider, Hommel, & Blettner, 2010). HMLR has an advantage because it tests the significance of improvement in $R^2$ each time variables are added to the model (Turkson & Otchey, 2015). Changes, if any, signify the independent variables’ power in predicting the dependent variable (Luo & Azen, 2013; MacKinnon, Fairchild, & Fritz, 2007). In these analyses, the variables were entered in steps, according to the assumptions of my research model (Dombrowski et al., 2016; Lindenberger & Pötter, 1998).

Structural equation modeling. Subsequently, AMOS-Structural Equation Modelling (SEM) was used to provide a more rigorous test of the mediational model. AMOS-SEM provides a model fit analysis of the hypothesized model (Gunzler, Chen, Wu, & Zhang, 2013). Unlike HMLR, AMOS-SEM can identify a relationship between latent variables in complex data and evaluate the most parsimonious model (Mccoyach, 2003; Weston & Gore, 2006).

Further analysis will be conducted to examine the indirect relationships between proactive ability, proactive motivation, proactive opportunity, and proactive safety behavior, as mediated by work engagement. In this study, it is important to determine the existence of direct effect and indirect effects between proactive ability, motivation, and opportunity, and proactive safety behavior. To test this, I used a bootstrapping method, which is designed to overcome the limitations of estimating the standard errors in the method developed by Baron and Kenny (Preacher, Zyphur, & Zhang, 2010). The focal point of the bootstrapping method is to identify the significance level of an indirect effect (Makinnon & Sherry, 2012) as opposed to the dichotomous view (mediation vs.
no mediation) of Baron and Kenny’s approach to testing for mediation. (Little, Preacher, Selig, & Card, 2007).

Two-wave panel model. Figure 7.3 shows the basic structure of a two-wave panel model. This model shows that each time-lagged variable has a direct path that estimates the stability between the same variables measured over time. Paths are then estimated from the proposed independent variable at T1 to the mediator at T2, and also from the mediator at T1 to the dependent variable at T2. Together, these paths test relationships proposed in the hypothesized mediation model. Alternative explanations can then be tested against this model, such as a direct path from the independent variables at T1 to the dependent variable at T2, and a reverse-path from the mediator at T1 to the independent variable at T2. Therefore, one of the advantages of the two-wave panel analysis is that it can identify the possible reverse direction of causal analysis between the variables (Samuelsson & Olson, 2013). Three models can be compared in this analysis, the hypothesized model, the alternative model, and the structural null model, also known as an unconstrained model.

Figure 7.3 Basic structure of a two-wave model
7.3  Results

In the following sections, I present the results for each of the analyses. First, I present the result of the Common Latent Factor (CLF) analysis with a marker variable for bias examination. Second, I present the outcomes of the exploratory and confirmatory factor analyses, the latter being designed to test the measurement model. Third, I present the correlations among all variables, both within and between periods. Fourth, I report the results of hierarchical linear multiple regression. Fifth, the results of the mediation testing are presented. Next, regression and SEM analyses involving a composite Proactive Ability-Motivation-Opportunity model are presented. Finally, the results of the panel model testing of alternative mediation pathways are reported.

7.3.1  Common latent factor method

Table 7.1 presents the correlation of research variables with the marker variable. All the variables were weakly correlated with the marker variable. Therefore, it is appropriate to use the CLF method. First, I ran CFA without the marker variable. The finding indicates that the factor loadings are at .27. After the insertion of the marker variable, the loadings are reduced to a minimum of .19, lower than .50 threshold value (Aslam, Muqadas, Imran, & Saboor, 2018; Sadikoglu & Zehir, 2010). This suggests that common method variance is not a threat to this research.
Table 7.1

*Correlation matrix between the research variable and marker variable SRDS-5*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tbody>
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<td>----</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2 Proactive Motivation (Can Do)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3 Proactive Motivation (Reason To)</td>
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<td>.60</td>
<td>----</td>
<td></td>
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<tr>
<td>4 Proactive Motivation (Energized To)</td>
<td>-.26</td>
<td>-.17</td>
<td>-.19</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Proactive Opportunity</td>
<td>.32</td>
<td>.48</td>
<td>.58</td>
<td>-.41</td>
<td>----</td>
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<td></td>
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<tr>
<td>6 Proactive Safety Behavior</td>
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<td>.37</td>
<td>.22</td>
<td>-.16</td>
<td>.17</td>
<td>----</td>
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<tr>
<td>7 Work Engagement</td>
<td>.41</td>
<td>.57</td>
<td>.62</td>
<td>-.35</td>
<td>.52</td>
<td>.22</td>
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<td></td>
</tr>
<tr>
<td>8 Marker variables (SRDS-5)</td>
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<td>-.36</td>
<td>-.27</td>
<td>.20</td>
<td>-.32</td>
<td>-.34</td>
<td>-.37</td>
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N=215
Table 7.2

Exploratory Factor Analysis findings for Time 1 Proactive Ability, Proactive Motivation, Proactive Opportunity, Work Engagement, and Time 2 Proactive Safety Behavior

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<tr>
<th>Factor</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tr>
<td><strong>Proactive Ability</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>No matter what the odds, if I believe in something, I will make it happen</td>
<td>.59</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I am always looking for better ways to do things</td>
<td>.89</td>
<td></td>
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</tr>
<tr>
<td>If I believe in an idea, no obstacle will prevent me from making it happen</td>
<td>.53</td>
<td></td>
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</tr>
<tr>
<td>If I see something I don’t like: I fix it</td>
<td>.73</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Proactive Motivation (Can Do)</strong></td>
<td></td>
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</tr>
<tr>
<td>Designing new procedures for your work area</td>
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<tr>
<td>Writing a proposal to spend money (in your work area)</td>
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<td>Presenting information to a group of colleagues</td>
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<tr>
<td>Making suggestions to management about ways to improve your work area</td>
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<tr>
<td><strong>Proactive Motivation (Reason To)</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because I am doing it for my good</td>
<td>.59</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because this work is fun</td>
<td>.73</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Because I feel good when doing this work</td>
<td>.86</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Because I believe that this work is important to me</td>
<td>.70</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Proactive Motivation (Energized To)</strong></td>
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<tr>
<td>Upset</td>
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<tr>
<td>Nervous</td>
<td>.84</td>
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<td>Afraid</td>
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<tr>
<td><strong>Proactive Safety Behavior</strong></td>
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<td></td>
</tr>
<tr>
<td>I think about ways to improve workplace safety</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>I imagine different ways in which workplace safety can be improved</td>
<td></td>
<td></td>
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<tr>
<td>I think carefully about how my ideas for improving workplace safety can be implemented before deciding how to act</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I initiate better ways of doing my core tasks more safely</td>
<td>.77</td>
<td></td>
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</tr>
<tr>
<td>I make changes to the way my core tasks are done to make them safer to perform</td>
<td>.77</td>
<td></td>
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<tr>
<td>I make suggestions to improve the overall safety effectiveness of the organization</td>
<td>.85</td>
<td></td>
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<tr>
<td>I come up with ways of increasing safety efficiency within the organization</td>
<td>.85</td>
<td></td>
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<tr>
<td><strong>Work Engagement</strong></td>
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<tr>
<td>At my work, I feel bursting with energy</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>At my job, I feel strong and vigorous</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My job inspires me</td>
<td>.79</td>
<td></td>
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<tr>
<td>When I get up in the morning, I feel like going to work</td>
<td>.88</td>
<td></td>
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<td></td>
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<tr>
<td>I feel happy when I am working intensely</td>
<td>.67</td>
<td></td>
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</tr>
<tr>
<td>I am proud of the work that I do</td>
<td>.82</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I am immersed in my work</td>
<td>.91</td>
<td></td>
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</tr>
</tbody>
</table>

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 6 iterations.
Path coefficients: *p < 0.5; **p < 0.01

*Figure 7.4.* The relationship between Proactive Ability (PA), Proactive Motivation (PM) and Proactive Opportunity (PO), Work Engagement (WE) and Proactive Safety Behavior (PSB)
7.3.2 Factor analysis.

Table 7.2 and Figure 7.4 summarise the findings of the EFA and CFA analyses. The cut-off point for a significant loading on a factor is pre-determined at a minimum of .4 consistent with as recommended (Osborne & Costello, 2009). Although .3 factor loading is acceptable (Cattell, 1965), another aspect such as communality must be considered. Communality is the shared variance reflected by the sum of squared factor loading (MacCallum et al., 1999). A sum squared of .4 is .16 while .3 is .09. In this case, .4 factor loading is higher hence opted as the cut-off point for the factor analysis (Tucker & MacCallum). There were seven factors extracted with an Eigenvalue of more than 1.0 through EFA. The CFA analyses indicate that the proposed 7-factor model has an acceptable model fit with CMIN/df=1.40, CFI=.94, and RMSEA=.04.

7.3.3 Correlation and descriptive statistics

Table 7.3 presents the means, standard deviations, and correlations between all the model variables at Time 1. The highest correlation was recorded between proactive motivation (Can do) with proactive ability ($r=.61$). Proactive safety behavior at Time 1 was significantly correlated with all model variables except proactive motivation (Energized to). Proactive motivation (Energized to) was not significantly positively correlated with any other variables. However, there was a significant negative correlation between proactive motivation (Energized to) and both proactive opportunity ($r=-.19$) and work engagement ($r=-.24$). Finally, proactive safety behavior at Time 1 was not significantly correlated with any of the demographic variables, other than safety training ($r=.22; p<.001$).
Descriptive statistics and correlations for Time 2 data are presented in Table 7.4. Consistent with the findings at Time 1, proactive safety behavior was not significantly correlated with any of the demographic/control variables, except for Safety Training ($r=.17$). The highest correlation was between proactive motivation (Can do) and proactive ability ($r=.63$), which is a similar result to that found at Time 1. However, in contrast to the findings at Time 1, the correlations between proactive motivation (Energized to) and both proactive opportunity and work engagement at Time 2 were not significant.

Of primary interest in this longitudinal study, however, are the observed relationships between variables across time, and in particular, the relationship between predictor variables in the model (measured at Time 1) and proactive safety behavior (measured at Time 2). Consistent with what is predicted by the theoretical model, proactive safety behavior (Time 2) was significantly correlated with the proactive ability ($r=.15$), proactive motivation (Can do) ($r=.41$), proactive motivation (Reason to) ($r=.31$), and proactive opportunity ($r=.43$), all measured at Time 1. However, proactive motivation (Energized to) at Time 1 was not significantly correlated with proactive safety behavior at Time 2. In other results of interest, proactive safety behavior (Time 2) was also significantly correlated with work engagement at Time 1 ($r=.45$).
### Table 7.3

**Correlations, means, standard deviations at Time 1**

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 1</th>
<th>Time 1</th>
<th>Time 1</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td>T1</td>
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<tr>
<td>Ages</td>
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<tr>
<td>Time 1 Opportunity</td>
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<table>
<thead>
<tr>
<th>Mean</th>
<th>SD</th>
<th>Age</th>
<th>Gender</th>
<th>Education</th>
<th>Tenure</th>
<th>Training</th>
<th>Ability</th>
<th>Can Do</th>
<th>Reason To</th>
<th>To Opportunity</th>
<th>Engagement</th>
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<tbody>
<tr>
<td>24.70</td>
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<td>1.56</td>
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<td>3.83</td>
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<td>-63**</td>
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<td>-0.20</td>
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<td>-0.24***</td>
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<td>0.02</td>
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<td>5.28</td>
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<td>0.82</td>
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<tr>
<td>4.60</td>
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<tr>
<td>4.60</td>
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<tr>
<td>4.60</td>
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<td>-0.01</td>
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<tr>
<td>4.60</td>
<td>1.07</td>
<td>-21*</td>
<td>0.01</td>
<td>-0.01</td>
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N=215

* Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed)
Table 7.4

Correlations, means, standard deviations at Time 2

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<td>Age</td>
<td>Gender</td>
<td>Education</td>
<td>Tenure</td>
<td>Safety</td>
<td>Promotion</td>
<td>Motivation</td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Correlation of T2</td>
<td>T2</td>
<td>T2</td>
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<td>.10</td>
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<td>.31**</td>
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</tbody>
</table>

N=215

* Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed)
### Table 7.5

**Correlations, means, standard deviations (Time 1 and Time 2)**

<table>
<thead>
<tr>
<th></th>
<th>TIME 2</th>
<th>TIME 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Means</strong></td>
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<tr>
<td>T1 Task Orientation</td>
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<tr>
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<td>2.95</td>
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<td><strong>T2</strong></td>
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<tr>
<td><strong>Means</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2 T training</td>
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<td>1.77</td>
</tr>
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<tr>
<td>T2 Proactive Safety Consciousness</td>
<td>3.61</td>
<td>3.71</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.05 level (2-tailed).**

**Correlation is significant at the 0.01 level (2-tailed).**

---

*Correlation is significant at the 0.05 level (2-tailed).**

**Correlation is significant at the 0.01 level (2-tailed).
Given the patterns of inter-correlations outlined in Tables 7.3 to 7.5, which are broadly consistent with the theoretical model, it was deemed appropriate to proceed with the multiple regression analyses.

7.3.4 Hierarchical Multiple Linear Regression

Table 7.6 presents the result of the hierarchical multiple regression analyses, comparing four models. Model 1 includes age, gender, level of education, and safety training (Time 1) as the control variables. Other than safety training, which was weakly related to proactive safety behavior at Time 2, none of the control variables were significantly related to proactive safety behavior, and collectively they accounted for only two percent of the overall variance in the dependent variable.

In Model 2, I included the variables' proactive ability, proactive motivation, and proactive opportunity (Time 1). The findings indicate a significant relationship with this block of variables and proactive safety behavior at Time 2 \( [F (11, 203) = 8.01, \ p < .01] \). Proactive motivation (Can do) is the strongest predictor of proactive safety behavior \( (\beta = .41) \), followed by proactive motivation (Reason to) at \( \beta = .20 \). Overall, the inclusion of the proactive ability, motivation, and opportunity variables in the model accounts for an additional 15% of the variance in Time 2 proactive safety behavior.
In Model 3, I included Work Engagement at Time 1. The results indicate that including this variable makes no significant additional contribution towards the prediction of Time 2 proactive safety behavior.

Finally, in Model 4, I included Time 1 proactive safety behavior. The ability, motivation, and opportunity variables remain as significant predictors of proactive safety behavior at Time 2, even when Time 1 proactive safety behavior is included.

Table 7.6
Hierarchical Regression Analysis Summary

<table>
<thead>
<tr>
<th>Model</th>
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<th>2</th>
<th>3</th>
<th>4</th>
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<td>β</td>
<td>β</td>
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<td>.00</td>
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<td>-.18*</td>
<td>-.15*</td>
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<td>-.04</td>
<td>-.03</td>
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<td></td>
</tr>
<tr>
<td>T1 Proactive Motivation Reason To</td>
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<td></td>
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<td></td>
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<tr>
<td>T1 Proactive Motivation Energized To</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>T1 Proactive Opportunity</td>
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<td>.00</td>
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<td>T1 Work Engagement</td>
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<td>.00</td>
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<tr>
<td>T1 Proactive Safety Behavior</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

F

|   | 1.88 | 8.01** | 7.04** | 8.49** |

ΔF

|   | 1.88 | 37.04** | 1.16 | 15.25** |

R²

|   | .04 | .19  | .19  | .25       |

R² (total adjusted)

|   | .02 | .16  | .16  | .22       |

T1=Time 1, T2=Time 2, β represents the standardized beta coefficient (the effect of an independent variable on the dependent variable)

N = 215; *p<.05, **P<.01
7.3.5 Mediation analysis

To control for potential confounding effects, all demographic factors were controlled to T2 proactive safety behavior (the dependent variable) (see Churchill, Ford, & Walker, 1976). For example, there is a possibility that the level of education, job tenure, and safety training could affect proactive safety behavior. The results indicated that T1 proactive motivation (Can do) had a significant unmediated effect on T2 proactive safety behavior. Path b was not significant, however. Therefore, T1 work engagement is not mediating the relationship between the predictors and the dependent variable in this instance (Imai, Keele, & Tingley, 2010).

Testing the direct and indirect effects of the model, I also performed a bias-corrected bootstrapping confidence intervals analysis to uncover the existence of direct or indirect effects associated with the model. The resampling was 2000, at a 95% confidence level. Table 7.7 summarises the total effects, direct effects, and indirect effects of the model.

The findings show a strong direct effect between proactive motivation (Can do), proactive motivation (Reason to), and proactive safety behavior. None of the independent variables were found to have significant indirect effects on proactive safety behavior. Therefore, it is concluded that work engagement did not mediate the relationship between precursors and proactive safety behavior.
### Table 7.7

**Findings of Bootstrapping**

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Bootstrapping result</th>
<th>Bias-corrected at 95% CI</th>
<th>Percentile 95% CI</th>
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<td></td>
<td>Estimate</td>
<td>Bootstrap S.E.</td>
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<tr>
<td><strong>Total effects</strong></td>
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<td>.14</td>
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<tr>
<td>Proactive Motivation (Can Do)</td>
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<td></td>
</tr>
<tr>
<td>Proactive Motivation (Reason To)</td>
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<td></td>
</tr>
<tr>
<td>Proactive Opportunity</td>
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<td>.15</td>
<td></td>
</tr>
<tr>
<td><strong>Direct effects</strong></td>
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<td></td>
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<tr>
<td>Proactive Ability</td>
<td>-.36</td>
<td>.14</td>
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<tr>
<td>Proactive Motivation (Can Do)</td>
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<td>.18</td>
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<td>Proactive Motivation (Reason To)</td>
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<tr>
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<td><strong>Indirect effects</strong></td>
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</tr>
<tr>
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</tr>
<tr>
<td>Proactive Motivation (Can Do)</td>
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<td>.04</td>
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<tr>
<td>Proactive Motivation (Reason To)</td>
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<td>.06</td>
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<tr>
<td>Proactive Motivation (Energized To)</td>
<td>-.01(n.s)</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Proactive Opportunity</td>
<td>.00(n.s)</td>
<td>.02</td>
<td></td>
</tr>
</tbody>
</table>

Note. Standardized regression coefficients $\beta$ are reported. * $p < 0.01$. ** $p < 0.001$. n.s=non-significant
7.4. A composite model of Proactive Ability-Motivation-Opportunity (Proactive AMO) and Proactive Safety Behavior

The previous analyses were conducted by segregating the factors of proactive ability, proactive motivation, and proactive opportunity and examining their independent relationships with proactive safety behavior. Although these analyses are supportive of the research model as illustrated in Chapter Four, it is important to note here that based on the High-Performance Work Systems (HPWS) approach; performance should be seen from a multiplicative or composite effect of the ability, motivation, and opportunity (Kim, Pathak, & Werner, 2015). In other words, Performance=f[Ability × Motivation × Opportunity] (Bailey et al., 2014; Boxall, 1996; Sterling & Boxall, 2013). Reflecting this, further analyses were conducted using a composite of the three proactivity variables. The composite variable was constructed by multiplying the means of proactive ability, proactive motivation, and proactive opportunity for the composite value (Poythress, Skeem, & Lilienfeld, 2006). There are a few principles to adhere to when developing a composite variable. First, the component measures need to be proven to be distinguishable from one another (Landis, Beal, & Tesluk, 2000). One of the feasible ways to identify the differences between the variables is by performing exploratory factor analysis (Distefano, Zhu, & Mîndrilă, 2009). The EFA findings are indicated in Table 7.2 and support the conclusion that the variables are theoretically and empirically distinguishable. Figure 7.4 presented the CFA, again supporting the independence of the three constructs. Thus, because the findings of EFA and CFA were satisfactory, the development of the composite variable is permissible. Following that, I multiplied the means according to this formula P=f(A×M×O).
Table 7.8

Means, Standard Deviations, control variables and Inter-correlations for Composite Model at Time 1

<table>
<thead>
<tr>
<th>T1 Age</th>
<th>Mean</th>
<th>S.D</th>
<th>T1 Age</th>
<th>T1 Gender</th>
<th>T1 Level of Education</th>
<th>T1 Job Tenure</th>
<th>T1 Safety Training</th>
<th>T1 Proactive AMO</th>
<th>T1 Work engagement</th>
<th>T1 Proactive safety behaviour</th>
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</thead>
<tbody>
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<td></td>
<td>24.78</td>
<td>2.26</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
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</tr>
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<td>.11</td>
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<td>-.24**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 Safety training</td>
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<td>.83</td>
<td>.02</td>
<td>-.10</td>
<td>.01</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>.05</td>
<td>.03</td>
<td>.04</td>
<td>-.07</td>
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<td>.64**</td>
<td>.50**</td>
<td>.56**</td>
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<td>.04</td>
<td>.17**</td>
<td>.50**</td>
<td>.56**</td>
<td></td>
</tr>
</tbody>
</table>

N=215, * Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed)
7.4.1 Correlation and descriptive statistics for Composite Proactive AMO.

Table 7.8 presents the means, standard deviations, and correlations at Time 1. The highest correlation was recorded between work engagement and proactive AMO with r=.64. Proactive safety behavior at Time 1 was significantly correlated with proactive AMO (r=.50) and work engagement (r=.56).

Table 7.9 presents the means, standard deviation, and correlations at Time 2. Time 2 work engagement and proactive AMO were positively correlated (r=.59). Unlike the findings at Time 1, Level of Education at Time 2 was weakly and positively correlated with proactive AMO (r=.15).

The correlations between Time 1 and Time 2 variables are shown in Table 7.10. Proactive safety behavior at Time 2 is significantly correlated with proactive AMO at Time 1. Work engagement at Time 1 is also significantly correlated with proactive AMO at Time 2 (r=.59). Proactive safety behavior at Time 1 is correlated with Proactive AMO at Time 2 (r=.50). Another interesting result is the significant correlation between Time 1 Proactive AMO and level of education at Time 2; the (r=.15).
Table 7.9

*Means, Standard Deviations, control variables and Inter-correlations for Composite Model at Time 2*

<table>
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<tr>
<th></th>
<th>T2 Age</th>
<th>T2 Gender</th>
<th>T2 Level of Education</th>
<th>T2 Job Tenure</th>
<th>T2 Safety Training</th>
<th>T2 Composite Proactive AMO</th>
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<td>3.31</td>
</tr>
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<td>N=215* Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).</td>
<td>2.26</td>
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<td>.67</td>
<td>.83</td>
<td>.59</td>
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<td>.94</td>
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</table>
Table 7.10

Means, Standard Deviations, control variables and Inter-correlations for Composite Model at Times 1 and 2

<table>
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<th></th>
<th>T1 Age</th>
<th>T1 Gender</th>
<th>T1 Level of Education</th>
<th>T1 Job Tenure</th>
<th>T1 Comspite Proactive AMO</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=215* Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).
7.4.2 Hierarchical Multiple Linear Regression

Table 7.11 presents the findings of Hierarchical Multiple Regression Analysis (HMLR) using proactive AMO variable and work engagement at Time 1 as independent variables, and proactive safety behavior at Time 2 as the dependent variable. Following the same approach as earlier, I tested four models. Model 1 includes just the demographic/control variables. In Model 2, I entered all the demographic variables and proactive AMO. There was a significant increase in the amount of variance explained \([F (6,208) = 8.01, **p<.01]\), and the shared variance was increased to 19%. Safety training was a significant predictor at \(\beta=.14\). Proactive AMO was the highest predictor with \(\beta=.39\). Next, in Model 3, I entered all the variables and work engagement. However, the shared variance remains unchanged at 19%. Finally, Model 4 includes proactive safety behavior measured at Time 1.
Table 7.11

**Hierarchical Regression Analysis involving the Composite Model of Proactive Ability-Motivation-Opportunity**

<table>
<thead>
<tr>
<th>Steps</th>
<th>Model</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Age</td>
<td>β</td>
<td>0.10</td>
<td>0.07</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>T1 Gender</td>
<td>β</td>
<td>0.02</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>T1 Level of Education</td>
<td>β</td>
<td>-0.13</td>
<td>-0.16</td>
<td>-0.16</td>
<td>-0.14</td>
</tr>
<tr>
<td>T1 Job Tenure</td>
<td>β</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>T1 Safety Training</td>
<td>β</td>
<td>0.17**</td>
<td>0.14*</td>
<td>0.13*</td>
<td>0.08</td>
</tr>
<tr>
<td>T1 Proactive AMO</td>
<td>β</td>
<td>0.39**</td>
<td>0.34**</td>
<td>0.24*</td>
<td></td>
</tr>
<tr>
<td>T1 Work Engagement</td>
<td>β</td>
<td>0.08</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 Proactive Safety Behavior</td>
<td>β</td>
<td></td>
<td></td>
<td></td>
<td>0.29**</td>
</tr>
</tbody>
</table>

\[ F \]
- 1.88
- 8.01**
- 7.04**
- 8.49**

\[ ΔF \]
- 1.88
- 37.04**
- 1.16
- 15.25**

\[ R^2 \]
- 0.04
- 0.19
- 0.19
- 0.25

\[ R^2 \text{(total adjusted)} \]
- 0.02
- 0.16
- 0.17
- 0.22

T1 = Time 1, T2 = Time 2, β represents the standardized beta coefficient (the effect of an independent variable on the dependent variable)

N = 215; *p<.05, **p<.01
7.4.3 Mediation analysis

Figure 7.5 provides the results of the mediation analysis with the composite variable. The model was deemed a good fit at CMIN/df=1.66, CFI=.95, RMSEA=.06. The paths $a$ and $c'$ were significant but not path $b$, which leads to the conclusion that mediation is not supported (Li, 2011). With the insertion of work engagement, path $c'$ coefficient was reduced, but it is still significant.

Path coefficients: *$p < 0.5$, **$p < 0.01$

*Figure 7.5* The relationship between Time 1 composite Proactive AMO variable, Work Engagement and Time 2 Proactive Safety Behavior

7.4.4 Testing the direct and indirect effect of Proactive AMO

Further analysis was carried out to assess the total effect, direct effect, and indirect effects of work engagement. I conducted a bias-corrected bootstrapping confidence intervals method, resampling in 2000, with a 95% confidence level. The findings are presented in Table 7.12.
Table 7.12 specifies the total effect, direct effect, and indirect effect of the composite variable of proactive AMO on proactive safety behavior, mediated by work engagement. The total effect is a product of $ab+c'$, while the indirect effect is $ab$. When comparing the indirect effect value to the direct effect, I can conclude that proactive AMO at Time1 has a direct effect on proactive safety behavior at Time 2 ($p < 0.001$). These findings signify that T1 Proactive AMO is independently associated with T2 proactive safety behavior.

Table 7.12

*Findings of Bootstrapping Methods: Work Engagement as a mediator between Proactive AMO and Proactive Safety Behavior*

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Bootstrapping result</th>
<th>Bias-corrected at 95% CI</th>
<th>Percentile 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Estimate</td>
<td>Bootstrap S.E</td>
</tr>
<tr>
<td>Total effects</td>
<td>.36**</td>
<td>.07</td>
<td>.21</td>
</tr>
<tr>
<td>Direct effects</td>
<td>.30**</td>
<td>.08</td>
<td>.13</td>
</tr>
<tr>
<td>Indirect effects</td>
<td>.06</td>
<td>.06</td>
<td>-.05</td>
</tr>
</tbody>
</table>

Note. Standardized regression coefficients $\beta$ are reported

* $p < 0.01$. ** $p < 0.001$. 
7.5 Panel model analysis

In this section, I report the results of the panel model analysis of variables across the two waves comparing three models. For mediation, panel model analysis is arguably the most effective way to determine an indirect effect by estimating the change of score from $X_1$ to $Y_2$ via $M_1$ and $M_2$ (Cole & Maxwell, 2003; Selig & Kristopher & Preacher, 2009), in contrast to traditional mediation analysis that only takes into account a single mediator; e.g., $X_1$ to $M_1$ to $Y_2$ (Selig & Preacher, 2009). The indirect effect is calculated by multiplying path $a$ and path $b$ (Lindwall, Larsman, & Hagger, 2011). The explanation is as in Figure 7.6 and Figure 7.7 respectively.

The three models were a) the hypothesized model of the composite variable of proactive AMO influencing proactive safety behavior (Model 1), b) an alternative model of proactive safety behavior influencing proactive AMO (Model 2), and c) a structural null model with no hypothesized paths being estimated (Model 3). The analysis was conducted using MPlus (McCoy et al., 2013).

Figure 7.6 depicts the hypothesized model of proactive AMO to proactive safety behavior, and Figure 7.7, the alternative model of proactive safety behavior to proactive AMO. Model 1 represents the hypothesized relationship between proactive AMO at Time 1 and proactive safety behavior at Time 2, mediated by work engagement. In Figure 7.6, we can see that all variables (Proactive AMO, work engagement, and proactive safety behavior) at Time 1 significantly predicted the variables at Time 2. The indirect effect is calculated based on the multiplying path $a$ and path $b$. The indirect effect is recorded at .04 proving no mediational relationship between T1 Proactive AMO and T2 proactive safety behavior. The findings indicated that even after eliminating
unobserved bias by calculating the value of T1 Work Engagement and T2 Work Engagement through panel model analysis (Nind, 2008), the indirect effect is still not significant. Model 2 specifies an alternative set of relationships, whereby proactive safety behavior acts as the predictor and proactive AMO at Time 2 is the outcome. Looking at Figure 7.7, we can see that the product of path $a$ and path $b$ is the indirect effect of the variables. Path $b$, which connects work engagement at Time 1 and proactive AMO at Time 2, is not significant.

Although the indirect effects for both models were non-significant, thus indicating that there is no mediated indirect effect in any of this model (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008), it is important to point out that the purpose of this panel model analysis was to determine the best model between the hypothesized model, the alternative model and the null model (Wheaton, Muthen, Alwin, & Summers, 1977). Among the threshold values used to determine the best model are the Confirmatory Fit Index (CFI) Root Mean Square Error of Approximation (RMSEA) and Akaike Information Criteria (AIC).
Figure 7.6 The hypothesized longitudinal mediation model. Note. X1, X2 = Predictor at Time 1; M1, M2 = Mediators at Time 1 and 2; Y1, Y2 = Outcome variables at Time 1 and 2. Coefficients $a$ and $b$ reflect associations between predictor and mediators, and mediators and outcome measures, respectively. The product $ab$ reflects the indirect effect of a composite model of proactive AMO (PAMO) on proactive safety behavior (PSB), through work engagement (WE).
Figure 7.7 The hypothesized longitudinal mediation model. Note. X1, X2 = Predictor at Time 1 and Time 2; M1, M2 = Mediators at Time 1 and 2; Y1, Y2 = Outcome variables at Time 1 and 2. Coefficients a and b reflect associations between predictor and mediators, and mediators and outcome measures, respectively. The product ab reflects the indirect effect of proactive safety Behavior (PSB) on Composite Proactive AMO, through Work Engagement (WE).

The results of these model comparisons are illustrated in Table 7.13 Although the Confirmatory Fit Index (CFI) cut-off points for both the hypothesized model and the alternative model indicates acceptable model fit (.96 and .94 respectively), the Root Mean Square Error of Approximation (RMSEA) for both models are slightly different. RMSEA has advantages over CFI because it can measure both sample estimates and inferential analysis (Kelley & Lai, 2011) and
preferred fit indices for confirmatory context (Rigdon, 1996). The suggested cut-off point for a good model fit concerning RMSEA indices is between .01 to .10 (Hu & Bentler, 1995). The RMSEA index for the hypothesized model is .08, indicating acceptable fit, while RMSEA for the alternative model is .12, which exceeds the guidelines for good model fit. Both CFI and RMSEA indices suggest that the structural null model is a worse fit to the data than either the hypothesized model or the alternative model.

Another way to assess model fit is by looking at the Akaike Information Criteria (AIC). AIC evaluates whether the population can explain the parameters (Snipes & Taylor, 2014). The threshold for AIC is unknown. However, the model with the smallest AIC should be noted as the best model (Tan & Biswas, 2012). As shown in Table 7.13, the hypothesized model has the lowest AIC at 2727.99; therefore, it may be accepted as the most parsimonious based on the given data (Vrieze, 2012). The relative chi-square (\(x^2/df\)) of the hypothesized model is at 5.23, slightly over the recommended ratio of an acceptable fit between 2.0-5.0 (Wheaton et al., 1977). However, it is ranked well than the alternative model and the structural null model. Hence, considering all the fit indices, it can be concluded that the hypothesized model has an acceptable model fit to the data, and is better in that respect than either the alternative model or the structural null model.
Table 7.13

*Comparisons between Different Structural Models (n=215)*

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>$x^2$</th>
<th>RMSEA</th>
<th>CFI</th>
<th>AIC</th>
<th>$x^2$/df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesized Model of PAMO - PSB</td>
<td>4</td>
<td>20.98</td>
<td>.08</td>
<td>.96</td>
<td>2727.99</td>
<td>5.23</td>
</tr>
<tr>
<td>Alternative Model of PSB - PAMO</td>
<td>4</td>
<td>30.88</td>
<td>.12</td>
<td>.94</td>
<td>2737.89</td>
<td>7.72</td>
</tr>
<tr>
<td>Structural null model</td>
<td>6</td>
<td>39.74</td>
<td>.16</td>
<td>.93</td>
<td>2742.76</td>
<td>6.62</td>
</tr>
</tbody>
</table>

The process of confirming the mediational relationship comprised of a few steps of analysis, namely Hierarchical Linear Multiple Regression (HLMR), Bootstrapping Analysis via AMOS-Structural Equation Modelling (SEM) and Panel Model Analysis with MPlus. Among these, bootstrapping analysis and Mplus are among the best analysis to examined a mediational analysis (MacKinnon, 2008; Preacher & Hayes, 2004). The advantage of bootstrapping analysis is its ability to estimate the mediation magnitude of effect and its significance level. Therefore, making it convenient to establish if there is a significant direct or indirect effect (Hayes & Preacher, 2014; Namazi & Namazi, 2016; Nelson et al., 2014; Rucker, Preacher, Tormala, & Petty, 2011). A composite model of Proactive AMO also produced a non-significant indirect effect on proactive safety behavior ($\beta=.06$). Another mediational data analysis was conducted through MPlus, and the findings from both the hypothesized models and alternative models are shown as non-significant. The additional information on the mediational relationship will be elaborated further.
7.6 Discussion

In this chapter, I presented the findings of a longitudinal study of the impact of proactive ability, proactive motivation, and proactive opportunity on proactive safety behavior, as mediated by work engagement. These findings provide support for the hypothesized model of the relationship between proactive ability, proactive motivation, and proactive opportunity, and proactive safety behavior. In particular, the findings provide support for the combined impact of proactive ability, motivation, and opportunity for proactive safety behavior. These findings are now discussed in further detail.

The first finding of note relates to the impact of various demographic variables on proactive safety behavior. The findings indicated that only prior safety training as a significant predictor of proactive safety behavior. This finding is consistent with the previous literature, whereby safety training is positively correlated with employees’ level of safety behavior (Andrei et al., 2015; Breslin, Smith, Mustard, & Zhao, 2006). Interestingly, however, the level of prior safety training was not related to either proactive ability, motivation, or opportunity. The fundamental core principle of safety training is to improve the knowledge and skills of doing the job safely and to reduce accidents (Howell et al., 1990). Safety training is insufficient to determine ability, motivation, and opportunity (Donovan et al., 2018; Ford & Stephens, 2018) in fact, the organizations must be more proactive in preparing and enforcing substantive strategy by using multiple channels to deliver safety information constantly (Mashi et al., 2018). Leadership plays an essential role in safety, where the leaders must be actively engaged to deliver information, to behave according to the safety standard, and this role goes beyond the designated and predetermined safety training provided by the organization (Grill et al., 2018). Young workers are reported to value safety leadership or prefer to receive constant encouragement and exposure from
their immediate supervisors in proactive safety behavior engagement (Tucker & Turner, 2017), especially in terms of mentoring and coaching in safety-related matters (Camm & Cullen, 1993; Kines et al., 2010). Other demographic variables such as job tenure and level of education findings are not significant predictors of proactive safety behavior. The finding supported previous research finding that job tenure and level of education is highly associated with working experience (Leitão et al., 2018). Hence, proactivity, awareness, and engagement on safety-related matters are more prevalent to the older workers cohort than the younger ones due to the working experience (Mullen, Kelloway, & Teed, 2011; Salminen, 2004). Furthermore, workplace safety is not thoroughly ingrained and developed in the curriculum, both at school and higher education levels (Ibrahim, Noor, Nasirun, & Ahmad, 2012). Therefore, young workers who are newcomers in the job market are having a limited understanding of workplace safety (Koo, Md Zain, & Mohamed Zainal, 2012).

Second, the finding has suggested that proactive ability is not predicting proactive safety behavior. From the Malaysian young workers' perspective, most of the employees are more inclined to follow procedures, not to challenge them (Khoo, Lilis, & Daisy, 2011). There was a consistency in findings on proactive personality and proactive safety behavior that can be traced from Study Two of this research where both findings have shown that proactive personality is not the determining factor of proactive safety behavior. Proactive ability, in this study, was assessed in terms of proactive disposition (Bateman & Crant, 1999), which may be a factor in how strongly it predicts the target behavior. In other studies of proactive disposition, this variable is affecting behavior and performance. For example, proactive personality significantly predicted proactive behavior (Bindl & Parker, 2010; Bjørkelo et al., 2010; Crant, 1995; McCormick, Guay, Colbert, & Stewart, 2019; Williams, Onsman, & Brown, 1996) and other proactive behavior forms such as innovative behavior (Fu, Flood, Bosak, Morris, & O’Regan, 2015; Montani et al., 2014), whistleblowing behavior (Liu et al., 2015; Miceli & Near, 1985) or voice behavior (Grant, 2013; Kanten & Ulker, 2012). However, based on the safety behavior literature, except for risk-taking
personality, other personality traits demonstrated a weak significant relationship with safety behavior (Beus, Dhanani, & McCord, 2015; Beus, McCord, & Zohar, 2016; Lucidi et al., 2019). Personality is considered as an external and distal predictor of safety behavior, and this is consistent with the safety behavior model (Neal & Griffin, 2002, 2004).

Third, and as predicted, proactive motivation was a strong predictor of proactive safety behavior. However, the findings also indicated that only two aspects of proactive motivation (Can-do, Reason-to) were themselves significant predictors of this behavior. Proactive motivation (Can-do) is associated with self-efficacy, a person’s ability, and confidence to execute a task. It showed that the participants have the confidence to engage in proactive safety behavior. The finding supported previous research on the relationship between one’s self-confidence with safety behavior (Belschak & Den Hartog, 2010; Grau, Martínez, Agut, & Salanova, 2002; Parker, 2000). The Proactive Motivation (Can Do) measure is adopted and adapted from the measure of Role-Breadth Self-Efficacy (RBSE) that emphasized how the current condition or the environment is affecting the young workers to motivate them to carry out a task beyond the job description in safety behavior engagement. Employees who are involved in RBSE are those who are attentive and confident to propose and execute actions for safety improvement (Parker, 2000; Schwaer, Biemann, & Voelpel, 2012). RBSE is influenced by Bandura’s Social Cognitive Theory (SCT) (Hwang et al., 2015) that acknowledged the Triadic Reciprocal Determinism of Environment-Person-Behavior (Zhang & Parker, 2018). Under this circumstance, the young Malaysian workers are aware of the volatile situation of workplace safety, hence took actions by recommending the extra initiative to the management.

Proactive motivation (Reason to) signifies the relevance of the Situation Motivational Scale (SIMS) derived from the Self-Determination Theory (SDT). Based on the findings from EFA, the
factors with the highest factor loading are items of intrinsically regulated and identified regulation motivational mechanism of SIMS. There was also a significant positive relationship between this factor and proactive safety behavior. Out of four items, only one item that relates to identified regulation, while the other three items are connected to intrinsically regulated motivation. This leads to a conclusion that the young Malaysian workers are engaging in proactive safety behavior because of personal satisfaction, and this is consistent with previous studies on safety behavior and proactive safety behavior (Conchie, 2013; Matteo Curcuruto et al., 2019; Fugas et al., 2012).

On the other hand, proactive motivation (Energised to) did not seem to be associated with proactive safety behavior. The nature of Proactive Motivation (Energized To) was to measure the effect of the positive and negative state of the young Malaysian workers on proactive safety behavior. Three items in the factor assessed the negative state, namely upset, nervous and afraid. The logical interpretation of this finding is that being upset, nervous and afraid is not predicting proactive safety behavior. Although previous research indicated that affective state could predict proactivity (Hong, Liao, Raub, & Han, 2016; Parker, 2013; Wu, Kwan, Wu, & Ma, 2018), the findings are associated with positive affect such as being determined and enthusiastic (Spitzmuller, Sin, Howe, & Fatimah, 2015; Zhang & Parker, 2018).

Fourth, the study found that the opportunity afforded by a job for someone to be proactive, assessed in terms of job autonomy, was not a predictor of proactive safety behavior. The finding has indicated that job autonomy is not a strong, stand-alone predictor in proactive safety behavior. Previous research on job autonomy indicated that there was a relationship detected between job autonomy and safety behavior; however, it has to be mediated by another variable such as commitment (Parker, Axtell, & Turner, 2001), leaders support and encouragement (Haas et al., 2019; Haas, Ryan, & Hoebbel, 2017) or motivation (Griffin & Curcuruto, 2016; Reiman et al.,
The nature of job autonomy is subjective, it’s about the perception of freedom is a result of improved work design (Fu et al., 2015), and work design falls under management values, that is one of the distal variables of safety behavior (Clissold et al., 2012). Hence, the findings of a non-significant predicting the relationship between job autonomy and proactive safety behavior are acceptable.

Drawing on the human resource management literature, this study also examined the degree to which proactive safety behavior could be predicted as a function of the combination of proactive ability, motivation, and opportunity variables. The study showed that the multiplicative approach of Ability-Motivation-Opportunity, as demonstrated through the composite model of Proactive AMO, significantly predicted proactive safety behavior. Previous research criticized the multiplicative approach of Ability-Motivation-Opportunity as rigid and extremely complex and not always assist in performance (Yu et al., 2020). However, the foundation of the multiplicative approach is sound, that all components must be presented for maximum performance achievement (Guerci, Radaelli, De Battisti, & Siletti, 2017; Kaufman, Starkman, Barry, & Wilkinson, 2012), thus rebutted all the criticisms. Most of the previous research favored the combination model that is accentuating the ability component as powerful that it can enhance motivation and opportunity (Almutawa, Muenjohn, & Zhang, 2016; Hoque et al., 2018). However, the proactive ability prediction power of this research is weak and insignificant, thus contradicting the perspective. Therefore, I argue that in the case of proactive safety behavior, all components of Proactive AMO are equally important.

Lastly, with respect to the additional hypotheses of a mediation analysis, I have examined the potential mediating role of work engagement in the relationship, as work engagement has previously been found to be an important psychological state that influences employee performance and behavior, including safety behavior (Chadwick, 2018; Kim & Beehr, 2018). While the study
found that work engagement was significantly correlated with proactive safety behavior, there was little evidence to suggest that work engagement mediated the relationship between the predictors studied here and proactive safety behavior. Work engagement is a two-fold connection. First, it is closely related to the strength of leadership and managerial support to maintain and sustain a positive work engagement, especially on safety (Donovan et al., 2018; Gagné, Scott, Fleming, & Kelloway, 2014). Second, an efficient manager that emphasizes safety must be well-informed and aware of the importance of safety, as a result of an effective safety climate predetermined by the organization (Fischer, Jones, & Verran, 2018). Previous studies on Malaysian workplace safety already affirmed that safety policy and safety climate are not fully enforced among Malaysian organizations, especially in Small and Medium Enterprises (SME) (Bahari & Clarke, 2013; Lani & Hassan, 2017). Therefore, it could be stated here that the non-significant relationship between work engagement and proactive safety behavior happened because the upper-level management has disregarded the importance of safety policy enforcement and monitoring, resulting in disengagement of proactive safety behavior (Ali, Abdullah, & Subramaniam, 2009; Khoo, Surienty, & Hung, 2015). Hence, the insignificant mediating effect is accepted.

Other contributing factors to this finding can be related to the development of work engagement among young workers. Work engagement always discusses the importance of autonomy as the main contributing factor for the dedication and enjoyment experience of the work task (Antoinette Bargagliotti, 2012; Gagné & Bhave, 2011). The autonomy that falls under the proactive opportunity component of this research is perceived as the freedom to carry out a task that allows the employees to express ideas and to customize the way they work according to their preferences for the best performance (Shin & Kim, 2014). The autonomy component is a prerequisite factor for work engagement to take place (Runhaar, Konermann, & Sanders, 2013). The employees must feel psychologically engaged and safe to alleviate effort in achieving personal and organizational objectives. Although the correlation between job autonomy and work engagement
was significant and positive ($r = .51$) in Table 7.5, the beta value of job autonomy in Table 7.6 stated otherwise ($\beta = .00$). The finding indicated that work engagement is not significant because either job autonomy is not granted or felt by young workers. Eventually, this result has ceased the possibility of a mediating relationship due to the weak and insignificant value of work engagement ($\beta = -.01$), as stated in Table 7.6 (Mackinnon, 2018).

Another possible explanation of the insignificant mediational relationship can be elaborated from the job tenure perspective. Previous studies have indicated that work engagement is more significant among employees who have been working for more than ten years (Byrne & MacDonagh, 2018; Moura et al., 2014). The means for job tenure for this research is recorded at 1.92 or less than two years. This short period is insufficient to nurture work engagement because the first two to five years of employment is critical for adjustment and socialization (Batistič & Kenda, 2018). Work engagement that increases over a period only perceived by the young workers if they are feeling more comfortable with the employment have self-confidence and subsequently developing loyalty and trust towards the organization (Byrne & MacDonagh, 2018; Enders, de Boer, & Weyer, 2013). Based on this evidence, I argue that the insignificant indirect effect of this research is a result of the non-existing work engagement value.
Chapter 8

Discussion and conclusion

8.1 Introduction

The overall aim of this research is to examine the mechanism of proactive behavior application into the context of safety behavior with an objective to understand and improve safety outcomes at work for young Malaysian workers. As is mentioned at the beginning of the chapter, it is hypothesized that there are at least three important components, namely proactive ability, proactive motivation, and proactive opportunity that can help to develop and understand the emergence of proactive safety behavior. The integration of these three components are crucial as it reflects the importance of the assimilation between individual and environmental components in determining proactive safety behavior. This chapter will discuss the overall findings and relationship between all the studies, as explained in the thesis. Apart from that, this chapter will also elaborate on the research contribution, theoretical, and practical implications. Finally, this chapter is aimed at addressing all the research questions underlined in Chapter One.

8.2 Addressing research questions

1. What are the core elements of a self-regulatory perspective on proactive safety behavior?

One finding to note from Study 1 to Study 3 is the importance of proactive ability towards proactive safety behavior. Looking back at Study 1 and Study 2, I could see that there were a trend and consistency of proactive ability and its importance towards proactive safety behavior among
young Malaysian workers, which then lead to my assumption in this research, that the proactive ability would have a strong relationship with proactive safety behavior. The proactive ability which was constituted by Proactive Personality by Bateman and Crant (1993), was supposed to have a strong relationship with proactive safety behavior. However, it was not the case in this research. As illustrated in Figure 8.1, proactive ability membership was in green or cool color which associated as the least important.

![Figure 8.1](image-url)

*Figure 8.1  *The finding of membership relatedness of proactive safety behavior framework in Study 1

In Study 2, the prediction power of proactive ability towards the proactive safety behavior of the young Malaysian workers was $\beta = .06$ and the weakest among other variables. In Study 3, the prediction power was significant at $\beta = .17$. However, the direct effect of proactive ability on
proactive safety behavior was insignificant at $\beta=-.36$, and the indirect effect was $\beta=.00$. The findings reflected that proactive ability was not a strong predictor of proactive safety behavior, based on the relationship underlined in the findings of Study One to Study Three.

Further investigation into scrutinizing the previous literature of proactivity among the young Malaysian workers was carried out to verify this assumption. There were studies conducted to identify the importance of proactive personality towards career success among Malaysian workers (Fee Yean, Yahya, Othman, & Pangil, 2013; Ismail, Mohd Nowalid, & Bakar, 2016). The findings indicated that there was a significant relationship between proactive personality and career success. However, studies on proactive personality and safety behavior, specifically among young Malaysian workers are unknown or unidentifiable.

However, in the context of the country’s structural system and power distance, there is a logical explanation for this situation. Power distance is relatively high in Malaysia (Zainuddin et al., 2013) where power is unequally distributed to the people, based on ranks and hierarchy in the society (Sivasubramaniam & Goodman-Delahunty, 2014). Young Malaysians are most probably perceived as subordinate, hence hold the lowest power in the community and at the workplace (Ibnu & Ahmad, 2017). They are expected to follow orders, rules and regulations unquestionably. Such limitation has seized any opportunities for this group of young people to exercise proactivity (Gu, Wang, Liu, Song, & He, 2018) in terms of taking the initiative or making changes concerning safety behavior. Therefore, it can be concluded that proactive ability among young Malaysians is not well-ingrained or is dampened by the country’s structural system, hence making it nearly impossible to observe a significant relationship between proactive ability and proactive safety behavior.
Looking back into the data, although proactive ability was not a significant predictor to proactive safety behavior, however, proactive motivation (Can Do) that was drawn from Role Breadth Self Efficacy (RBSE) was a significant predictor to proactive safety behavior in Study 2 ($\beta=.32$) and Study 3 ($\beta=.37$). Also, in Study 3, proactive motivation (Can Do) had a direct effect on proactive safety behavior ($\beta=.41$). Proactive motivation (Can Do) is the perceived capability of doing or completing a task beyond the designated predetermined requirements (Axtell & Parker, 2003; Parker, 1998, 2000). Proactive ability (which in this case is proactive personality) is a stable disposition, that instead tends to change the environment (Marler, & Hester, 2012; Parker & Wang, 2015; Tucker & Turner, 2015). As a developing country, Malaysia is currently braving a challenging phase of solving economic and social issues (Porter & Kramer, 2011; Ziguras & Law, 2006) and one of them is workplace safety (Alaarj, Mohamed, Salwa, & Bustamam, 2017; Javaid et al., 2018; Likita et al., 2018). Most of the time, workplace safety issues revolve around a safety climate that often is neglected by organizations (Mashi et al., 2018; Tayaparan et al., 2018). In most of the cases, safety climate is unavailable, and this situation has created a volatile workplace condition that forced employees to respond to this difficult situation (Erdogan, Ozyilmaz, Bauer, & Emre, 2018; Suffian, Rohani, & Mariam, 2018). Which in this case, the employees are required to have the confidence if they want to change their working environment to a safer workplace which can be seen from the findings; proactive safety behavior was strongly predicted by, and associated with the motivational mechanism of proactive motivation (Can Do).

Previous research on workplace safety assumed that safety behavior would flourish under a well-executed organizational safety climate set by the management (Cui, Fan, Fu, & Zhu, 2013; Eid, Mearns, Larsson, Laberg, & Johnsen, 2012; Neal & Griffin, 2004). However, this stance is contradicted by Hoffman and Morgeson that founded Safety Citizenship Role Definition and Behavior, which was also perceived as proactive safety behavior (Hofmann & Morgeson, 1999). The foundation of Safety Citizenship Role Definition and Behavior (SRCDB) theoretical
framework was built on the discretionary behavior of organizational citizenship perspective and the importance of social relationship to improve the current work task (Organ, 1997; Organ & Ryan, 1995; Smith, Organ, & Near, 1983). Under this viewpoint, the success of proactive safety behavior relies on the helping behavior of the organizational members or the feeling of selflessness.

A new approach of proactive safety behavior emerged and underlined the importance of two mechanisms: personality traits and the influence of situational factors such as supervisors’ and co-workers’ norms toward the employees’ proactive safety behavior (Fugas et al., 2011, 2012). Although motivation was widely discussed in the safety behavior literature (Griffin & Neal, 2000; Ismail, Doostdar, & Harun, 2012; Probst & Brubaker, 2001; Zohar, 1980), however, the debate on the relationship between self-motivation and proactive safety behavior is still insufficient. The motivational aspect in proactive safety behavior was not given enough attention until Fugas et al. and Curcuruto et al. acknowledged the importance of self-motivation in proactive safety behavior (Curcuruto, Conchie, Mariani, & Violante, 2015; Curcuruto & Griffin, 2018; Fugas, Silva, & Meliá, 2013). However, the number of studies on this issue is limited. In the hypothesized model, I have included a proactive personality scale for proactive ability and organizational support for proactive opportunity. Also, I discussed the cognitive orientation of motivation (Proactive motivation-Can Do), the motivation to achieve outcomes and goals (Proactive motivation-Reason To) and affective-motivational mechanism (Proactive motivation-Energized To) and explained its role in the employees future-oriented proactive safety behavior engagement. Therefore, I believed this model is holistic and robust theory-driven research.

2. How can proactive safety behavior be measured?

This research question is answered through the qualitative study (Study One), Study Two, and Study Three. In Study One, proactive safety behavior is measured by examining the young worker's action upon seeing or experiencing unsafe conditions while at work. The young workers' proactive
safety behavior is evaluated by their responses in overcoming dangerous conditions in the workplace. For Study One, the measurement was a set of questions, being asked during an interview session that looked into scrutinizing the process of the ability to change the situation, the actions they took to improve the problem, the reasons behind such activities and also other contextual factors that can assist in proactive safety behavior engagement. Findings from Study One are necessary to help in building hypotheses about proactive safety behavior for the use of Study Two and Study Three. Proactive safety behavior for Study Two and Study Three was also developed based on three dimensions, namely proactive ability, proactive motivation, and proactive opportunity. However, proactive safety behavior is measured based on the process approach, as is discussed in Chapter Two. The measurement is adapted and adopted to the safety perspective from the proactive goal regulation consisted of four stages; envisioning, planning, enacting, and reflecting (Bindl et al., 2012).

For this research, social context is measured from ‘proactive opportunity’ that relates to the improvement of work design that can alleviate the way of doing jobs. The role of social context, such as the co-workers’ and leaders’ support, was discussed from Study One to Study Two. In Study One, it was quite palpable to see that based on the visual map, the young workers believe that leaders and co-workers are the two most essential factors in proactive safety behavior. The findings for Study Two described consistency with the result of Study One. After the EFA, social support recorded as the most significant in the analysis. Therefore, it can be argued that based on the findings from Study One and Study Two, social support is important in proactive safety behavior (see Jiang, Yu, Li, & Li, 2010; Takahashi & Winefield, 2014).

However, in Study Three, the longitudinal research design found out that autonomy which is part of the proactive opportunity, had no significant influence on proactive safety behavior. The differences between findings from Study Two and Study Three are quite notable. In Study Two, the
linear regression indicated that proactive opportunity, which consisted of social support, demonstrated a significant prediction power to proactive safety behavior. One of the reasons behind the findings is the Common Method Variance (CMV). For Study Two, the data were collected in the same timeframe, therefore, increased the variance inflation, caused a significant positive prediction to proactive safety behavior (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff & Organ, 1986). Whereas in the case of Study Three, proactive opportunity (autonomy) such as the flexibility to do jobs was not predicting proactive safety behavior engagement. The finding is consistent with previous research by Parker, Axtell, & Turner (2001). The research findings revealed that job autonomy’s prediction power is only significant if mediated by the feelings of attachment to the organization’s value, and goals (Cook & Wall, 1980; Kim, Nurunnabi, Kim, & Jung, 2019). In short, without clear communication from the management about the importance of workplace safety, proactive safety behavior achievement is relatively impossible, no matter how broad or high the job autonomy is.

(3) What are the psychological factors (e.g., ability, motivation) that predispose young Malaysian workers to engage in proactive safety behavior?

The findings of Study One described that the ‘Reason To’ involve in proactive safety behavior is intrinsically motivated. Most of the young workers engage in proactive safety behavior for the needs of self and family well-being. Based on the interviews, none of the young workers involved in proactive safety behavior to gain rewards or to avoid punishments. The findings are consistent with the previous research on the discretionary safety behavior such as safety citizenship behavior that emphasized the main reason to engage in a safe behavior is for self-sustainability, for the family and the colleagues’ well-being (Fernandes, Widyahening, Mustopo, Kusumadewi, & Mangundjaya, 2018; Geller, 2016; Geller, Roberts, & Gilmore, 1991). For Study Two and Study Three, the influence of intrinsic motivation is more robust than extrinsic motivation. Therefore, the
findings confirm that intrinsic motivation is the main motivational mechanism in determining proactive safety behavior (see Matteo Curcuruto & Griffin, 2016; Matteo Curcuruto et al., 2019).

The data from Study One indicated that young workers are keen to initiate changes and engage themselves with proactive safety behavior. In other words, the young workers are active to voice out concern on workplace safety for the benefit of themselves and others. This is consistent with previous research on workplace safety where the young workers are known as an active agent that will voice out concern over any unsafe condition at work (Tucker, Diekrager, Turner, & Kelloway, 2014; Turner, Tucker, & Deng, 2020). The main reason for proactive safety behavior is due to self-preservation that relates to agility, superiority, and competency to succeed (Pfeffer, 2013). In the case of proactive safety behavior of the young workers in Malaysia, the need for self-preservation is the main motivating factor in proactive safety behavior engagement. In Study Two and Three, there were striking similar findings to support this argument. The young workers are more inclined to perceive proactive safety behavior engagement as intrinsically motivated; that they see it as something good and very important for them too. This finding is consistent with previous research that indicated people who are engaged in proactive safety behavior are those who have ownership of the job or the workplace (Matteo Curcuruto et al., 2019).

The findings of Study 4 indicated that there are significant differences between the Malaysian sample and the Australian sample. Although proactive ability between the two samples is not the strongest predictor in proactive safety behavior, however, there are differences between the magnitude of the proactive ability of the two samples. Malaysians are known to have a higher power distance (Zainuddin et al., 2013); therefore, any actions or behaviors that are known to be more advanced or opposing the norms are often mistaken as ‘rebellious’ (Brosi et al., 2018). In a high power distance country, people who are ranked lower in the hierarchy (young people, people with lower education) are expected to follow orders and structures. Therefore, proactive ability
such as personality is not nurtured well and young people tend to follow the structure to avoid unnecessary disagreement.

8.3 Implications

From a methodological point of view, this research has contributed significantly to the development of a proactive goal regulation framework of safety behavior. Previous research on proactive safety behavior only emphasized Safety Citizenship Behavior, adapted from the Organizational Citizenship Behavior construct (Hofmann & Morgeson, 1999; Hofmann, Morgeson, & Gerras, 2003). Although Safety Citizenship Role Definition and Behavior may have some dimensions that are similar to proactivity, overall it does not include the future-focused dimension; that is unique and relevant to proactive behavior (Bindl & Parker, 2010; Parker, Bindl, & Strauss, 2010). Furthermore, this research aimed to examine the process approach of productivity that relates to proactive goal regulation consisted of envisioning, planning, enacting, and reflecting. The findings from Study Two and Study Three showed a good model fit, hence making it feasible to argue that this research has developed a measurement for proactive safety behavior consistent with the construct of future-focused, goal regulated process and not the organizational citizenship behavior.

From a theoretical point of view, I also proposed the integration of three important components to building proactive safety behavior; proactive ability, proactive motivation, and proactive opportunity. This integration is drawn from High-Performance Work Systems (HPWS), which estimated that performance or behavioral achievement should be based on three important mechanisms derived from the individual and contextual dimensions (Boxall, 2009; Boxall & Macky, 2009; Warmerdam et al., 2018). I recommended a composite measurement of Proactive
Ability-Motivation-Opportunity and then tested it against proactive safety behavior. Based on the model findings, I argue that the composite model of Proactive Ability-Motivation-Opportunity can predict proactive safety behavior, hence supporting the notion that ability, motivation, and opportunity must exist for proactive safety behavior to emerge.

Based on the findings of Study One to Study Three, it is safe to recommend that some improvements can be made into strengthening future research. I would suggest that any research involving work engagement should be carried out among employees with more than five years of working experience. This is consistent with previous research findings on the influence of job tenure and work engagement (see Bakker & Demerouti, 2018; Sonnentag, Mojza, Binnewies, & Scholl, 2008). Work engagement is about the positive effect of the work and the workplace which relates to the feeling of enjoyment at doing the job, that eventually drives the employees’ spirit to work and to achieve the organizational objectives (Diestel, Rivkin, & Schimdt, 2014; Marinova et al., 2015). Therefore, work engagement is less likely to be achieved for any employees servicing the organization for less than at least five years.

Other than that, it is essential to note here that the element of safety knowledge should be operationalized and tested in future research on proactive safety behavior. Based on the review, there is an insufficient argument that can support or promote the importance of safety knowledge in the development of proactive safety behavior. Although I have explained the information-seeking behavior among the young workers in Study One, however, it is brief and insufficient and was not included in the research model. I hypothesized that the functional role of safety knowledge brings more depth to understand proactive safety behavior.
8.4 Limitations

The limitation of this research was the single source, self-reported measurement. Common Method Variance (CMV), a condition of spurious shared variance between the variables caused by a single source measurement approach (Podsakoff et al., 2003; Podsakoff & Organ, 1986), may cause the findings to be unreliable. However, I have controlled CMV by including a set of marker variables in the survey questions. I also adopted two-wave longitudinal research as a remedial solution to control CMV. For future research, I hope to continue this investigation with a multilevel analysis, three-wave longitudinal studies.

The time lag for data collection of this research was six weeks apart, following a previous investigation by Demerouti, Bakker, Jonge, Jassen, & Schaufeli (2001). In the paper, the authors argued that job demands predicted health impairment, such as exhaustion and health complaints and job control predicted learning motivation. The prediction was detected within six weeks. However, in the health and well-being research area, it was a norm to conduct data collection in a shorter time frame because short-term effects on health could be detected conveniently (Hafner, Van Stolk, Saunders, Krapels, & Baruch, 2015; Tucker & Folkard, 2012). Though, the research was a predictive, not causal analysis that requires a considerable amount of time to see effects (Rothman, 2006; Dormann & Zapf, 1999; Goldsmith, Chalder, White, Sharpe, & Pickles, 2016). Moreover, in behavioral research, time lag is crucial because it will determine bias; if the time lag is too short, the lower the probabilities of any related effects between the variables could be investigated (Cordery, Mueller, & Smith, 1991; Podsakoff et al., 2003; Taris & Kompier, 2014). Therefore, in behavioral research, effects would normally take place in a longer time interval (Davies & Pickles, 1985; Dormann & Zapf, 1999). There were an abundant of previous studies on safety behavior that confirmed that a longer interval between phases of data collection would demonstrate effects
between variables (Andersen, Nørdam, Joensson, Kines, & Nielsen, 2018; Conchie, 2013; Grill, Pousette, Nielsen, Grytnes, & Törner, 2017; Neal & Griffin, 2006; Tucker & Turner, 2017). Although there were findings indicated that effects did take place after real events (Bleidorn, Hopwood, & Lucas, 2018; Jensen, 2016; Lindwall et al., 2011), but, the impact was inconsequential as compared to data collected from a long time interval (Kanner, Coyne, Schaefer, & Lazarus, 1981). Henceforth, because this research’s data collection was within six weeks, I can confirm that it caused the non-significant indirect effect between the variables.

8.5 Conclusions

In conclusion, I hope that this thesis will provide a foundation for further comprehensive research into proactive safety behavior by young workers. The safety and well-being of young workers’ in the workplace is paramount and should continue as a main focus of discussion not only in Malaysia but throughout the world. The young workers’ safety issue is crucial to the long-term planning of all countries, but particularly developing nations like Malaysia. Most developing countries are dependent on young people for the successful growth of their economies. They cannot afford to lose young people’s skills, abilities and future potential due to occupational accidents and injuries.
References


of Economic Research, 14(15).


Bahari, S. F., & Clarke, S. (2013). Cross-validation of an employee safety climate model in


Baron, R. M., & Kenny, D. a. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of


Belschak, F. D., & Den Hartog, D. N. (2010). Pro-self, prosocial, and pro-organizational: Foci of


https://doi.org/10.1037/a0024368


https://doi.org/10.1037/a0024368


https://doi.org/10.1348/096317910X486385


https://doi.org/10.2466/PMS.58.1.173-174


https://doi.org/10.1111/j.1744-6570.2009.01137.x


Byrne, Z. S., Miller, B. K., & Pitts, V. E. (2010). Trait entitlement and perceived favorability of


https://doi.org/10.1016/j.jsr.2004.08.004


Debusscher, J., Hofmans, J., & De Fruyt, F. (2017). Core self-evaluations as a moderator of the

https://doi.org/10.1080/1359432X.2016.1277706


https://doi.org/10.1016/j.ejpoleco.2018.08.008


Retrieved from http://www.amazon.com/Numerical-Analysis-Spectral-Methods-
Applications/dp/0898710235


https://doi.org/10.1111/j.1467-6486.2012.01055.x


Fernandes, A., Widyahening, I. S., Mustopo, W. I., Kusumadewi, D., & Mangundjaya, W. L.
https://doi.org/10.1088/1742-6596/1073/4/042014

https://doi.org/10.1183/09031936.96.09061160


https://doi.org/10.1111/jonm.12519


Nordic Psychology, 61(2), 29–45. https://doi.org/10.1027/1901-2276.61.2.29


compliance with work procedures: An engagement perspective. *Safety Science.*
https://doi.org/10.1016/j.ssci.2018.01.019

https://doi.org/10.4135/9781412963909


Kong, Y., & Li, M. (2018). Proactive personality and innovative behavior: The mediating roles of


Malinauskiene, V., Leisyte, P., Romualdas, M., & Kirtiklyte, K. (2011). Associations between self-

https://doi.org/10.1111/j.1365-2648.2011.05685.x


https://doi.org/10.1186/s12913-017-2656-7


https://doi.org/10.1007/s00464-007-9396-4

https://doi.org/10.4090/juee.2008.v2n2.033040


https://doi.org/10.1037/0021-9010.92.5.1200


https://doi.org/10.1111/j.1744-6570.1995.tb01781.x


Parker, Sharon K. (2013). Beyond motivation: Job and work design for development, health,
https://doi.org/10.1146/annurev-psych-010213-115208


Probst, T. M., & Brubaker, T. L. (2001). The effects of job insecurity on employee safety outcomes:

---


Probst, T. M., & Brubaker, T. L. (2001). The effects of job insecurity on employee safety outcomes:


and health. *Social Science and Medicine, 103,* 94–100.

https://doi.org/10.1016/j.socscimed.2013.12.029


https://doi.org/10.1080/10705519609540052


https://doi.org/10.1016/j.ssci.2016.02.023


https://doi.org/10.1007/s13398-014-0173-7.2


https://doi.org/10.1016/j.tele.2004.11.007


https://doi.org/10.1016/j.iimb.2018.05.001


https://doi.org/10.1016/j.wep.2014.03.001


https://doi.org/10.1016/j.heliyon.2017.e00334


https://doi.org/10.3310/hsdr02120


https://doi.org/10.1016/j.ssci.2018.03.016


https://doi.org/10.1016/j.jacalib.2004.09.009


Psychology, 90(5), 1027.


https://doi.org/10.2174/1745017901107010161


https://doi.org/10.1186/s12877-016-0392-1


https://doi.org/10.3758/s13428-014-0499-2


