DISSERTATION

USING EXPECTANCY THEORY TO EXAMINE OCCUPATIONAL FUTURE TIME PERSPECTIVE WITH SAFETY MOTIVATION AND SAFETY PERFORMANCE

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Madison E. Hanscom

Department of Psychology

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Doctoral Committee:

Advisor: Jeanette Cleveland

Alyssa Gibbons
Kevin Murphy
Lynn Shore
Mark Prince

ABSTRACT

USING EXPECTANCY THEORY TO EXAMINE OCCUPATIONAL FUTURE TIME PERSPECTIVE WITH SAFETY MOTIVATION AND SAFETY PERFORMANCE

By better understanding employee safety motivation, organizations have the potential to reduce work-related accidents and injuries by improving motivation and safety behaviors. In the present study, the construct domain of safety motivation is expanded through the theoretical lens of expectancy theory by utilizing three components of safety motivation (i.e., valence of safety outcomes, instrumentality of safety outcomes, and expectancy) in addition to the most commonly utilized facet of safety motivation (i.e., safety importance). When these motivational facets were examined with three types of safety performance in the same model, results showed different relationships depending upon the safety performance outcome. The two motivational facets that showed the strongest relationships with safety compliance were both safety expectancy and safety importance. Safety expectancy was the strongest predictor of both safety participation and safety initiative. These findings indicate that expectancy theory can be applied within the safety space to explain the utility of safety motivation in predicting multiple types of safety performance. In a separate model, intrinsic and extrinsic components of valence and instrumentality were also examined, illustrating differential relationships with safety performance when these constructs are considered separately.

As the age of the workforce increases, it is also important to understand how perceived time horizon might be associated with safety motivation and safety performance. In the present study, occupational future time perspective (OFTP; defined as a worker's perception of their

remaining time and perceived opportunities left in their career) was examined as potential predictors of the multifaceted view of safety motivation. Results indicated as an individual's perceived opportunities at work increases, this was associated with an increase in all facets of safety motivation and performance; however, as one's remaining time increases at work, this was associated with weak negative relationships or no significant relationship with safety motivation. These results are discussed in relation to previous research and theory.

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CHAPTER 1: INTRODUCTION

Research on occupational safety has been increasing with the goals of both enhancing workplace safety and saving lives. Though a significant amount of progress has been made over the last century in injury and fatality reduction (Hofmann, Burke, & Zohar, 2017), fatal accidents occur too frequently at work. For instance, 5,147 workers died on the job in 2017 in the United States alone (U.S. Bureau of Labor Statistics, 2018). There are psychological, physical, and financial costs to organizations when safety incidents occur. By better understanding employee safety motivation, organizations have the potential to reduce work-related accidents and injuries by improving motivation and safety behaviors (e.g., Christian et al., 2009; Clark, 2006).

Recently there has been a growing interest in aging workforce research as it relates to occupational health and safety (Crawford, 2016). Older employees remain in the workforce longer and have a faster projected growth rate than any other age group (U.S. Bureau of Labor Statistics, 2018). This trend presents opportunities for safety professionals to ensure workers of all ages are motivated and protected from occupational hazards. Scholars agree motivational changes occur across the lifespan, and this is supported by both theory and empirical research (e.g., Carstensen, 2006; Carstensen et al., 2011; Rudolph et al., 2018). While scholars have determined there are age-related changes involved with motivation, what is needed is research illustrating age-related perceptual changes as a determinant of safety motivation. Further, there have been calls for research on age-related motivation within the workplace safety context and for the investigation of the role of multiple components of safety motivation (Akkermans, 2016).

This study examines the role of workers' career time perspectives (Occupational Future Time Perspective [OFTP]; defined as a worker's perception of their remaining time and

perceived opportunities left in their career; Zacher & Frese, 2009) in determining their motivation to engage in the behaviors that lead to safety in the workplace. I use well-established motivational theory (expectancy theory) to frame this study. This research makes four contributions. The first contribution is a more thorough examination of the construct domain of safety motivation (through the theoretical lens of expectancy theory) specifically by utilizing different components of safety motivation (i.e., intrinsic and extrinsic valence, intrinsic and extrinsic instrumentality, and expectancy). In order to move the theoretical field forward, a portion of this study empirically tests and builds on the theoretical proposition by Beus and Taylor (2018) to test expectancy theory within a safety framework. Further, a more extensive profile of safety motivation and how this relates to the more comprehensive understanding of safety performance could allow practitioners to make more informed decisions about motivational interventions to change behavior (e.g., Lim, Fang, & Wu, 2018).

The second contribution is to examine the relationship between this expanded understanding of safety motivation on safety performance. The construct domain of safety performance is expanding. Until recently, researchers conceptualized safety performance primarily using two behaviors (safety compliance and safety participation). Recent scholars have recognized a third performance component called safety initiative (Curcuruto et al., 2018), and there has yet to be research to describe the relationship between different components of safety motivation with this updated, three-dimensional understanding of safety behavior. By testing a more comprehensive understanding of safety motivation and differential relationships associated with varying types of safety performance, this could provide safety professionals with information on what is needed to motivate safety behavior (Curcuruto et al., 2019).

The third contribution is to examine Occupational Future Time Perspective (OFTP; Zacher & Frese, 2009) on motivation within a safety framework. By examining the differential relationships of OFTP on safety motivation, we can better understand how a person's perception of perceived opportunities they have at work influences different safety-related motivational components. This could potentially direct the attention of organizations to improve safety motivational outcomes associated with age-related variations over time.

The fourth contribution of this study is to investigate the potential role of safety climate in strengthening or weakening the relationships between OFTP and safety motivation. Motivational researchers emphasize how the context plays a role in how employees form motivation (e.g., Diefendorff & Chandler, 2011; Kanfer et al., 2017). In the present study, the context of safety climate is examined to better understand the influence of time perspective on safety-related motivational components as defined by expectancy theory.

There is evidence to suggest unsafe behaviors and performance at work can be reduced through increasing the safety motivation of employees (e.g., Christian et al., 2009). Currently, research examining the motivational forces that contribute to safety performance is still emerging and developing. Though safety motivation is understood to be an individual's willingness to work safely and why they work safely (e.g., Casey et al., 2017; Neal & Griffin, 2006), safety motivation is primarily measured by asking employees how important working safely is to them (e.g., Christian et al., 2009). This approach lacks the ability to uncover a more comprehensive understanding of safety motivation to answer "why" one is motivated to work safely. To better understand and define the components of safety motivation, we will begin with the broader foundation of the general work motivation literature.

Work Motivation

Motivation has been described as a psychological process that influences arousal, direction, and persistence of behavior that is voluntary or goal directed (Mitchell, 1982). It is also often described as "an unobservable force that directs, energizes, and sustains behavior over time and across changing circumstances" (Diefendorff & Chandler, 2011, p. 66). Kanfer et al. (2017) explain how the most recent conceptualization motivation is considered to be a goal-directed resource allocation process that is dynamic and influenced by the context (e.g., time, experience, place). Researchers agree work motivation is distinct from the ability of the person and the situation (e.g., Diefendorff & Chandler, 2011; Van Iddekinge, Aguinis, Mackey, & DeOrtentiis, 2018). Motivation is a topic of great concern for Industrial / Organizational Psychologists because it is related to job performance and it describes the choices workers will make, how much effort they will expend, and how they will persist in the effort in the work context (Campbell, 1990; Van Iddekinge et al., 2018).

Main Conceptualizations of Work Motivation

There are many ways to organize motivational theories, though a useful way in the Industrial / Organizational Psychology literature is to categorize them by (1) content-based approaches, (2) context-based approaches, and (3) process-based approaches (e.g., Kanfer, Frese, & Johnson, 2017). Content-based theories are those that focus on internal attributes of a person or the internal influences of motivation. These are theories that emphasize the reasons for action, capturing the desires, wants, and needs of a person that elicit action (Kanfer et al., 2017). An example of a content-oriented theory is Self Determination Theory (Deci & Ryan, 1985) which explains how satisfying basic needs (i.e., for autonomy, for competence, and for relatedness or interpersonal connection) affect intrinsic motivation (when people find activities enjoyable for

one of these reasons and not due to external reasons like monetary rewards). Other content-based theories include those that emphasize the role of personality traits in motivation and other individual differences such as differences in goal orientation to explain why motivation is not uniform across all individuals.

Context-based theories focus on the external environmental influences that affect motivation, recognizing that the context plays a role in motivation. A prominent theory used to emphasize how the context influences motivation in the academic literature is Job Characteristics Theory (e.g., Hackman & Oldham, 1975) which explains how there are five key features of a job that enhance or harm work motivation among other important outcomes (Humphrey et al., 2007). The five key features are skill variety (e.g., the ability for the person to use a diverse array of skills), task significance (e.g., feeling as if the job has a positive impact), task identity (e.g., the ability for the worker to understand how their work fits into a larger picture of the business or mission), autonomy, and feedback.

Finally, process-based theories integrate content and context-based approaches, emphasizing both individual perceptions and the environment. These integrative theories focus on how cognition (the person) and the context interact to affect arousal, direction, and persistence of behavior (Kanfer et al., 2017). Process-oriented theories are mainly concerned with either goal striving or goal choice. Goal striving theories explain the process of action in attempting to achieve the goal. An example of a goal striving theory is self-regulation theory (Bandura, 1991; Kanfer & Ackerman, 1989), which broadly explains how motivation is a process and individuals monitor their progress toward achieving a goal through different types of feedback, and adjust actions accordingly based on that information. Goal choice theories describe how beliefs and cognition interact to explain motivational force or intentions. An

example of a goal choice theory is expectancy theory (Vroom, 1964) which explains how people make decisions to inform motivational force based on three components: the level of satisfaction they expect to feel from achieving the outcome or the desirability of the outcome to the person (valence), the probability that they will achieve the outcomes if they perform the behavior (instrumentality), and the likelihood they can reach the level of performance needed if they expend effort (expectancy). For the contributions of the present study, expectancy theory is used as the motivational framework in the present study. Before explaining expectancy theory more specifically, it is helpful to review how work motivation is measured in scholarly research.

The Measurement of Work Motivation

Approaches of measuring motivation vary widely depending on the type of motivation or which motivational theory is utilized. Researchers have used a broad range of motivational correlates and proxies to measure the level or force of motivation. For instance, some researchers use the notion of goals as a motivational force in order to measure the construct of motivation, while other researchers might focus on self-efficacy, traits, or commitment (e.g., Didendorff & Chandler, 2011). Some researchers use a subjective approach (asking workers about motivational indicators) whereas others use objective approaches (directly observing factors such as timeliness, attendance records, and so on).

Most commonly, researchers blend approaches and measure "motivational indicators" depending on the study at hand. An example from the literature, Judge and Ilies (2002), in a meta-analysis examining personality and performance motivation, examined three different measures that corresponded to parts of three different theories of motivation. Those measured were goal setting (goal difficulty), expectancy (whether working on an activity would result in attaining a specific outcome), and self-efficacy (the perceived ability to perform a task or job).

Another common approach to measuring motivation is using the Motivational Trait Questionnaire (MTQ; Kanfer & Ackerman, 2000), which is a 48-item questionnaire measuring variables such as core self-evaluations, desire to learn, and achievement striving. The most common approaches of conceptualizing and measuring motivation in the safety literature is discussed in a later section.

Expectancy Theory

Vroom's (1964) expectancy theory of motivation describes how people determine their actions from their perceptions. Expectancy theory can be traced back to older motivational theorizing, such as hedonism (the idea that people will always select rom alternatives the one that they believe with maximize pleasure and minimize pain) as found in the work of ancient Greek philosophers (Lawler, 1971), and to Tolman's (1932) cognitively oriented approach to explaining behavior. Although there were other similar early approaches to expectancy theory that included concepts like valence and expectancy (e.g., Atkinson, 1958; Edwards, 1954; Peak, 1955; Rotter, 1955), Vroom's 1964 theory was built on these theories and was specifically rooted in in the work environment. Later conceptualizations of expectancy theory (i.e., Valence-Instrumentality-Expectancy theory; VIE theory; Porter & Lawler, 1968) have expanded and elaborated on the theory to develop what we study as expectancy theory today.

Expectancy theory pertains to the process in which an individual's motivational force underlying a course of action or goal is determined by a series of judgements regarding the (1) valence, (2) instrumentality, and (3) expectancy associated with the action. Valence refers to the intensity of feelings an individual has in respect to a given outcome associated with the action. For instance, is the outcome seen as desirable or attractive to the employee? Instrumentality is the belief that a given quality or quantity of performance or a behavior will lead to the desired

outcome, whether it is a reward, recognition, or some other result. Expectancy refers to the belief that the individual can effectively perform the behavior if they expend the effort.

The subjective evaluation of these three facets is posited to interact to result in the motivational force in a multiplicative fashion (i.e., *Motivation = Valence * Instrumentality * Expectancy*). Therefore, if any of the components equal zero, the motivational force would be absent (Vroom, 1964). Expectancy and instrumentality were later theorized to range from 0 (no expectation) to 1 (full expectation). Valence was conceived to potentially be negative (ranging from -1 to 1), making it possible to have a negative result from the multiplicative equation. As a result, this could result in the avoidance of the outcome, not only just the absence of motivation.

This theory was developed in the 1960s while several other motivational theories were also in development, yet expectancy theory emphasized the cognitive processes that enhance or limit motivation (Budworth & Latham, 2014). Rather than explaining what motivates employees (such as incentives) to act, process theories (such as expectancy theory) illustrate *why* employees are motivated to act (Kanfer, Frese, & Johnson, 2017). Expectancy theory has been applied to a variety of work contexts and behaviors. For instance, researchers have used VIE theory to explain why employees are motivated to engage in faking behavior (Ellingson & McFarland, 2011), why employees are motivated to act ethically (Fudge & Schlacter, 1999), why faculty are motivated to do research (Tien, 2000), why adults are motivated to learn (Gorges & Kandller, 2012), why applicants withdraw (Acikgoz & Sumer, 2018), and much more.

There are practical work-related implications associated with this theory, mainly that managers can consider these different motivational facets (or mechanisms of force) when attempting to develop employees or structure the work environment. One initial step is to collect systematic information from employees about their valences of the work and rewards associated

with the work (i.e., valence), employees' perceived likelihood of obtaining rewards or outcomes if effort is expended (i.e., instrumentality), and make an effort to clearly tie positive outcomes to performance and how they can best direct efforts to obtain them (i.e., expectancy; Vroom, Porter, & Lawler, 2015). In addition, leaders could identify where weaker links (e.g., E → P; P → O) exist within the team or organization and take steps to improve these weaknesses. For instance, if a deficiency in expectancy exists (the link between effort and performance; E → P) that is due to lower ability or self-efficacy, this could possibly be strengthened by training. If the reason behind low expectancy is a goal that is too difficult, this might be addressed by setting more realistic goals (Matsui, Okada, & Mizugucki, 1981), However, it is important to note that goals without rigor (too easy) are associated with low valence. Thus, a balance between realistic and challenging goals is ideal.

The Evolution of Expectancy Theory

Following the original theory by Vroom (1964), several authors have criticized the original conceptualization of the theory and have since expanded expectancy theory. Although research demonstrates the effectiveness of valence, instrumentality, and expectancy in explaining motivational force in performance (e.g., Fudge & Schacter, 1999; Heneman & Schwab, 1972; Lawler & Suttle, 1973), there have been criticisms of the theoretical model. The main criticisms of expectancy theory were that (1) it was too simplistic, (2) there was not enough detail on instrumentality, (3) it did not provide enough detail in distinguishing actions and outcomes, and (4) the relationships between the motivational facets associated with actions and outcomes (Campbell, Dunnette, Lawler, & Weick, 1970). As a result of the criticism, the theory has since been further developed, mainly through clarification and elaboration (Lawler & Sutton, 1973).

Several researchers have expanded on it (e.g., Graen, 1969; Lawler, 1971; Lawler & Porter, 1967; Porter & Lawler, 1968), though the most notable is Porter and Lawler (1968) and Lawler's (1971) additions which provided more detailed linkages among the three motivational facets, behavioral action, and outcomes. For instance, Lawler (1971) illustrated how expectancy involves the "effort to performance" or E→P link where the individual is sure that effort will or will not lead to indented performance. They explain how this is influenced by factors such as self-esteem and previous personal and observed experience in similar situations. This is different from instrumentality, where the "performance to outcome" or P→O link represents the relationship between the individual's belief that the performance (or behavioral action) will indeed lead to desired outcomes. Similar to the original conceptualization, motivational force continues to be a multiplicative model where the three VIE components lead to effort, which lead to performance, which leads to rewards. However, the role of the situation and other variables (ability, equity of outcome, individual differences like extremely low or high self-esteem, or locus of control) are acknowledged to contribute more to V, I, and E in this model and add complexity to the previous straightforward nature of the theory. Vroom himself commented on how expectancy theory has benefited from the criticism and expansion since the original publication of the theory (Vroom, 2005).

Finally, the multiplicative nature of expectancy theory has been criticized (e.g., Evans, 1991). Vroom, Porter, and Lawler (2015) explain how expectancy has adapted throughout the years as it has been tested by scholars. They also note that problems still remain in regard to the multiplicative description of the original theory, and many researchers acknowledge this deficiency and rather utilize an additive process instead (p. 108; Vroom, Porter, & Lawler, 2015). Thus, it is now commonly accepted both theoretically and empirically that an additive

model is the more preferable way to conceptualize how the motivational facets explain the force behind behavior, as supported by meta analytic evidence (Van Eerde & Thierry, 1996). A multiplicative model suggests that the motivational force will equal zero (or will be absent) if any of the motivational facets (V, I, or E) are extremely low. Alternatively, an additive model suggests these motivational facets are compensatory, demonstrating an independent contribution to motivational force, thus if one VIE facet is low and the others are high, the motivational force can still exist. This has been demonstrated empirically, and also argued to hold true theoretically, because many have expressed how the required computations theorized are time consuming and as defined would exceed working memory capacity (Lord, Hanges, & Godfrey, 2003). Locke (1975) criticized expectancy theory for assuming people consistently choose to maximize outcomes, and for assuming people have the ability to make such complex evaluations in making choices toward desired outcomes. The additive theory is more realistic, as argued by Griffin and Harrell (1991), because people use additive information processing over multiplicative ones in practice.

This is not the only theoretical space within the Industrial and Organizational Psychology literature that has evolved from a multiplicative to an additive model. For many decades it was the main understanding that performance could be explained by the multiplicative relationship between motivation and ability (e.g., Maier, 1955; Vroom, 1964; Porter & Lawler, 1968). Van Iddekinge et al. (2018) recently challenged this notion, demonstrating empirically that the multiplicative model does not explain more variance beyond the additive effects of the model, and it only accounted for a small percentage of the explained variance in performance.

There are forces internal and external to the person that can affect motivation. In the present study, motivation is examined alongside lifespan development theory. A person's perceived

amount of opportunities and time left at work are considered as potential influential factors in valence, instrumentality, and expectancy.

Work Motivation and the Lifespan

The workforce is aging. By 2024 it has been projected the labor force will increase to approximately 13 million workers who are 65 years or older (BLS, 2018). This age group is projected to have faster growth rates than any other group. People are staying in the workforce longer and more generations work together than ever before. These trends present opportunities for organizations to ensure that workers across the entire lifespan are motivated and accommodated. Recently, research has grown on this topic such that age is no longer included onnly as a control variable, but a focal point of examination (Truxillo & Fraccaroli, 2013) and older workers are recognized to be great value to companies (Ng & Feldman, 2008).

Work motivation has been established as a key determinant in predicting behavior or job performance (e.g., Van Iddekinge et al., 2018). Further, researchers recognize the importance of considering age-related and lifespan factors as they relate to motivation at work. Older workers have been stereotyped as growing less motivated across the lifespan (Stamov-Roßnagel & Hertel, 2010), yet this has not been supported by empirical research (e.g., Ng & Feldman, 2010). However, there is evidence to support the stability of performance across the lifespan (Ng & Feldman, 2008). Importantly, there is not a universal or aggregate decline in motivation with age (Kooij & Kanfer, 2019). However, evidence does support lifespan variations in specific types of motivation, sometimes referred to as multidirectional motivation (e.g., Stamov-Roßnagel, 2015). Two theories explain and compliment this evidence (Socioemotional Selectivity Theory and Selection Optimization and Compensation Theory) as described below.

Lifespan Theory

Lifespan models illustrate how throughout the course of life there are both consistencies and changes in preferences and behavior (Bales, 1987). Lifespan theories of development at work "capture the numerous changes that are part of the aging process and undoubtedly affect work motivation" (Kooij & Kanfer, 2019; p. 482). There are a great deal of forces internal and external to the person that can affect motivation, such as changes in crystalized and fluid ability, perceived utility and desirability of work-related outcomes, family-related dynamics such as caring for an older parent or raising grandchildren, societal norms, and more (Baltes, Staudinger, & Lindenberger, 1999; Kanfer & Ackerman, 2004).

The two most influential lifespan theories are Selection Optimization and Compensation Theory (SOC Theory; Baltes, 1997) and Socioemotional Selectivity Theory (SST; Carstensen et al., 1999). SOC Theory explains the process of motivational selectivity, in which we age successfully when we learn to maximize gains and minimize losses (Baltes & Baltes, 1990; Baltes, 1997). First, there is the strategic *selection* of focusing one's resources and adapting in terms of contexts, outcomes, and goal structures. It is important because this process directs a person's behavior based on their hierarchy of goals, which is necessary because one's resources are often limited; therefore, it is crucial to focus on what is most primary. This could include a worker shifting their motivational focus to different tasks as they please across their work lifespan in order to feel more motivated. *Optimization* occurs when the individual enhances their skills and abilities that help them reach their goals. An example of this could be practicing what they have identified to be more difficult tasks. *Compensation* occurs when an individual is faced with age-related loss and they use alternative means to reach goals and/or maintain functioning. An example of this could be asking for help with work tasks. Another example is increasing

social relationships to compensate for coping with age-related losses. Through this SOC process, individuals are able to accommodate any age-related losses, stay motivated, and meet their demands throughout the lifespan.

The second lifespan theory is Socioemotional Selectivity Theory (SST; Carstensen et al., 1999; Carstensen, 2006), which describes how an individual's perception of time (their time horizon; their "time since birth" vs. "time until death") affects their motivation. SST suggests that those who perceive time as more open-ended or expansive are more motivated by goals involving growth, knowledge acquisition, experiences that have novelty, or other goals where optimizing or investing in the future is the primary focus. Conversely, those who perceive time to be more limited or restricted are more concerned with the "here and now". This includes goals and preferences that maximize meaningful activities for the present, such as emotionally satisfying activities, and other short-term emotion-related goals like deepening one's existing relationships (Carstensen, 2006).

As SST posits, when people age, their time perspective shifts, and this influences motivational changes such that they experience increases in some types of motivation (e.g., socio-emotional) and decreases in others (e.g., instrumental). In short, perceptions of the future change with age, and this influences motivation. SST explains how motivation is determined in temporal contexts, and individuals prioritize goals and focus energy based on this assessment of time in the lifespan. With increasing age and a decreasing perception of time, emotion-related goals become more important to the individual because this allows the person to prioritize meaningful experiences in order to enjoy the present. For instance, it has been demonstrated that adults increase in emotional-wellbeing and emotional stability, such that with age the older individuals experience negative emotions less intensely and positive emotions with a similar

intensity of younger adults (measured over a 10-year time period; Carstensen et al., 2011). Further, older adults attend to and remember positive information over negative information or stimuli, and this helps those with shorter time perspectives to achieve higher emotional gratification (referred to as the positivity effect, Barber et al., 2016).

With a lower chronological age there is an association with a longer perception of time (or a more expensive perception of time). This has been shown to be related to information-focused goals and knowledge acquisition, because these are what will help them in the longer term (English & Carstensen, 2016). Further, this more expansive perception of time is related to motivations associated with career progression and development. For instance, in a study examining motivations for volunteering, it was revealed that younger and older volunteers participate for different reasons. Younger volunteers were more likely to have motivations associates with their career growth, whereas older volunteers were driven by social motivations (Okun & Schultz, 2003).

Alternative Age Constructs

Although much of the research on aging and work motivation involves chronological age (e.g., Akkermans et al., 2016), theorists in lifespan perspectives of work motivation recognize that "shifting goals are likely the result from age-related factors and not from age in itself" (Kooij & Kanfer, 2019; p. 484). Research has shown that alternative age measures can provide information beyond that provided by chronological age when explaining work behavior (e.g., Cleveland & Shore, 1992). Alternative age is a term for a construct that measures age in a way that is not traditional chronological age (or the number of years a person has lived). There are several types of alternative age measures, including those such as subjective age (how old a person feels they are regardless of their chronological age; Steitz & McClary, 1988), disparity

age (the number of years between a person's actual age and ideal age; Barak & Gould, 1985), social age (the age status of an individual as rated by others; Kastenbaum et al., 1972), perceived relative age (the perceived age of an individual when comparing themselves to some group (Lawrence, 1984), awareness of age-related changes (all the experiences a person encounters that make them aware that their life has changed as a result of growing older; Diehl & Wahl, 2010), and more (Cleveland, Hanscom, & Huebner, 2017). Future Time Perspective (FTP) is an additional alternative age measure. The construct emerges from SST, and measures whether a person feels their future is limited (finite or open-ended (Carstensen, 2006). Cate and John (2007) have established FTP to be a two-dimensional construct, measuring (1) how individuals perceive their opportunities and (2) how individuals perceive and focus on their limitations.

Research supports alternative age to be a more predictive measure of motivational changes throughout the lifespan than chronological age (e.g., Rudolph et al., 2018). This is because aging is complex; it is a biological, social, and psychological progression that differs for people within the same birth year, gender, race, and so on, and alternative age measures greater capture this complexity than chronological age (e.g., Barnes-Farrell, Rumery, & Swody, 2002; Cleveland, Shore, & Murphy, 1997; Hertel & Zacher, Kooij, De Lange, Jansen, & Dikkers, 2008; Schwall, 2012). For example, when considering FTP, there have been circumstances in which younger people have constrained perceptions of their future (e.g., through terminal illness or a traumatic event) and subsequently display similar changes in motivation as those who are chronologically much older than them who are also experiencing future-limiting phenomenon. After New York City was attacked on September 11th in the United States, young adults suddenly felt the instability of life and reported a desire to spend time with closer family and friends over newer acquaintances, highlighting a shift to a constricted time perspective

motivation often associated with older adults (Fung & Carstensen, 2006). Another example of this phenomenon has occurred in young men diagnosed with HIV, suddenly experiencing a time perspective shift and reevaluation of motivation when compared with similarly aged men without symptoms (Carstensen & Fredrickson, 1998). FTP has been helpful in explaining and understanding behavior across the lifespan. A related construct, Occupational Future Time Perspective, more closely examines FTP in the work context and is discussed further in the next section.

Occupational Future Time Perspective

Occupational Future Time Perspective (OFTP) is an alternative age construct that offers a great deal of evidence in explaining workplace motivation. Whereas Socioemotional Selectivity Theory explains how individuals prioritize goals and focus energy based on their assessment of future time perspective, OFTP explains this phenomenon in the work context by examining work-related future time. In alignment with SST, research shows workers with a more expansive OFTP are motivated by knowledge acquisition, whereas workers with a more constrained OFTP are more motivated by emotional and social gratification (Henry, Zacher, & Desmette, 2017). Furthermore, there has been a great deal of research illustrating the relationship between OFTP and important work outcomes such as performance, engagement, job satisfaction, and successful aging at work (Cheung, Yueng, & Wu, 2019; Schmitt, Zacher, & de Lange, 2013; Weikamp & Göritz, 2016; Zacher, Heusner, Schmitz, Zwierzanska, & Frese, 2010).

Zacher and Frese (2009) developed the construct of OFTP and defined it as a workers' perception of their remaining time and opportunities left in their career. There are two positively correlated, yet conceptually and empirically distinct dimensions of OFTP (e.g., Kochoian, Raemdonck, Frenay, & Zacher, 2017; Weikamp & Göritz, 2016; Zacher & Frese, 2009). The

first is the person's assessment of how many perceived opportunities or prospects they still have at work (perceived opportunities; PO) and the second is the person's appraisal of how much time they have remaining at work (remaining time; RT; Zacher & Frese, 2009).

Both Remaining Time OFTP (RT-OFTP) and Perceived Opportunities OFTP (PO-OFTP) are [negatively] related to age, such that older workers perceive both their remaining time and perceived opportunities to be more constrained than younger workers. However, it is important to note that the negative relationship is stronger between age and Remaining Time ($\rho = -0.61$) than between age and Perceived Opportunities ($\rho = -0.34$), suggesting PO is more influenced by the context than RT (Rudolph et al., 2018). As such, there is a stronger relationship between job characteristics such as autonomy and PO ($\rho = 0.24$) than there is with RT ($\rho = 0.11$). Although both PO-OFTP and RT-OFTP are related to several work outcomes, there are circumstances in which differences exist between the dimensions. For instance, Perceived Opportunities OFTP is significantly related to task performance whereas Remaining Time OFTP is not (Rudolph et al., 2018). In other circumstances, differences in strength exist. For example, Perceived Opportunities is more strongly related to work engagement ($\rho = 0.34$) than Remaining Time OFTP ($\rho = 0.12$, whereas Perceived Opportunities is less strongly related to retirement intentions ($\rho = -0.28$) than Remaining Time OFTP ($\rho = -0.40$).

Scholars have shown how OFTP is related to motivational constructs such as achievement motivation (Rudolph et al., 2018), motivation to continue working (Kooij, Bal, & Kanfer, 2014), and learning motivation (Kochoian et al., 2017). In the current study, OFTP is examined in conjunction with safety motivation as a unique contribution. This is explained further in the next section.

Safety Motivation

Safety motivation is usually defined as an individual's willingness to work safely (Casey, Griffin, Harrison, & Neal, 2017), or more specifically, "an individual's willingness to exert effort to enact safety behaviors and the valence associated with those behaviors" (Neal & Griffin, 2006, p. 947). It is an integral part in the most recognized models of workplace safety (Griffin & Neal, 2000) and is an established as a main determinant of safety performance (Christian et al., 2009). Safety motivation has also been shown to influence safety behavior across time when longitudinal methods have been utilized (Neal & Griffin, 2006; Probst & Brubaker, 2001). It is also a common recommendation or suggestion for organizations to focus on boosting safety motivation in order to ensure safety-related improvement (e.g., Ford & Tetrick, 2008).

Outside of the scholarly literature, safety motivation is also regarded as a critical component of occupational safety within the popular press and professional sources. For instance, when the word "motivation" is used as a search term on the website for Occupational Safety and Health (OSH; a common practitioner publication source for workplace safety news and guidance), there about 1,600 articles that match the topic. When "motivation" is used as a search term within the Centers for Disease Control and Prevention website, there are 5,481 hits. When it is used within the National Institute for Occupational Safety and Health, it yields 713 hits.

Within the academic literature, safety motivation is most commonly measured using the four items developed by Neal, Griffin, and Hart (2000) or the later three-item revision of this measure by Neal and Griffin (2006). These items ask the individual how much they agree with statements regarding how worthwhile it is to put in an effort to maintain or improve safety, and the importance of reducing the risk of accidents and injury in the workplace. These items have

been used in many studies in the workplace safety literature (e.g., Bunner et al., 2018; Christian et al., 2009; Del Corso, 2008; Probst et al., 2013; Jiang & Probst, 2016; Neal, Griffin, & Heart, 2000; Probst, Graso, Estrada, & Greer, 2013; Zacharatos, Barling, & Iverson 2005). When comparing the content of these items to valence, instrumentality, and expectancy, this is a distinct concept of motivation. The Neal and Griffin measure captures the importance of safety and the behaviors associated with working safely, whereas valence captures how desirable the individual feels the *outcomes* are that result in working safely (different than importance, e.g., Mitchell, 1974; Parker & Dryer, 1976; Vroom, 1964). Further, instrumentality is if the individual feels their effort or actual performance will result in those outcomes associated with working safely, and expectancy describes the individual's belief in their ability to actually perform the safety behaviors. In the present study, each of these four types of motivation will be measured. Please see Table 1 for how the three main components of VIE have been conceptualized in the more general work motivation literature and how they will be adapted in the present study to the safety domain.

Table 1
A summary of the expectancy theory components within the general work motivation literature vs. the present study

	General Work Motivation Literature (e.g., Vroom, Porter, & Lawler, 2015)	The Present Study (adaptation for use in the safety domain)
Valence	Feelings of desirability or attractiveness an individual has in respect to a given outcome associated with an action.	How the individual feels in regard to the desirability of the *outcomes* associated with the action or behavior of working safely. In the present study, valence includes an intrinsic and extrinsic component, such that participants are asked about the desirability of both intrinsic and extrinsic outcomes that are associated with working safely.

Instrumentality	The belief that a given quality or quantity of performance or a behavior will lead to the desired outcome.	The extent to which a person believes working safely will result in desired outcomes. In the present study, instrumentality will also include an intrinsic and extrinsic component, such that participants will be asked how likely it is for their safety-related behaviors to result in intrinsic or extrinsic outcomes.
Expectancy	The belief that the individual can effectively perform the behavior if they expend the effort.	An individual's beliefs in their ability to enact safety behaviors or to work safely.

The Need for More Safety Motivation Research

Despite the research supporting the significant role of safety motivation in the role it plays to explain safety performance, researchers have commented on the need for more research on safety motivation (e.g., Pederson & Kines, 2011). In the only meta-analysis available examining safety motivation (Christian et al., 2009), only five studies were available with enough information to include in the analyses. Additional research is needed on safety motivation. For instance, even though there is empirical support for the importance items as conceptualized by Neal and Griffin (2006), research is still needed to draw conclusions about different forms of safety motivation (Casey, Griffin, Flatau Harrison, & Neal, 2017). Although there is research support for this measure of safety motivation (i.e., importance), there are other types of safety motivation that are understudied, and additional research is needed to explain the potential influence of different types of motivation with distinct types of safety behavior. Curcuruto, Parker, and Griffin (2019) have started this process by examining proactive safety motivation (i.e., self-efficacy and control beliefs, ownership and felt responsibility, anticipation and improvement orientation) and its relationship with safety initiative behavior. Although these authors expanded this area of study by examining these newer conceptualizations of safety motivation and performance, Curcuruto et al. (2019) did not examine this emerging motivational

type (proactive safety motivation) on all three dimensions of safety behavior (i.e., compliance, participation, and initiative). In the present study, I examine four distinct types of safety motivation (i.e., valence, instrumentality, expectancy, and importance) on several types of safety performance (i.e., safety compliance, safety participation, and safety initiative) in order to fulfill this need. Expectancy theorists encourage examining the theory in specific content areas (e.g., Porter & Lawler, 1968; Vroom, Porter, & Lawler, 2015) and additional research is needed in the realm of safety motivation. The present study begins to address this need.

Advantages to Studying Multiple Types of Safety Motivation

Scholars in motivation research acknowledge that motivational theories are complimentary. There is no single motivational theory that provides a full explanatory model, and several theories of motivation can be used to best understand a topic (e.g., Diefendorff & Chandler, 2011; Miner, 2015; Kanfer al., 2017). It would be advantageous to study safety motivation within an expectancy theory framework in order to expand our knowledge on the topic. Currently, the safety motivation literature is saturated with the safety importance perspective, and we are missing the breadth of motivation due to these missing components. It has been argued that studying a single facet of motivation is insufficient because workers have shown to experience some types of motivation and not others, and this could have differential effects on behavior. Parker et al. (2010) state it is possible for a worker to feel unable to perform a task (expectancy), but they still find the outcomes associated with performing the task to be desirable (valence), resulting in inaction. In this circumstance if valence was measured as a singular type of motivation, it would not successfully predict behavior. There is empirical evidence to support the notion that each of the expectancy theory components (valence, instrumentality, and expectancy) contribute unique and meaningful variance in predicting

motivation (e.g., Chiang & Jang, 2008), thus if we fail to measure certain aspects of motivation, there is construct deficiency and a loss of predictive power. Additionally, if distinct motivational facets have differential relationships across varying safety behavior types, this could potentially allow a more tailored approach to designing interventions with the intention of changing safety behavior. According to Lim, Fang, and Wu (2018), "…most previous research has focused on how motivated employees are to work safely [level of motivation] and has paid little attention to understanding the reason employees are motivated to work safely [facets of motivation]. Without identifying the cause of certain safety behavior, it is difficult for the practitioners to make an effective intervention for safety improvement" (p. 1). A multidimensional conceptualization of motivation has the potential to help safety professionals better understand the performance of their employees.

Expectancy Theory in the Safety Literature and Current Study

The concept of using expectancy theory as the conceptual or theoretical basis for studying safety motivation is not new (e.g., Barg, Ruparathna, Mendis, & Hawage, 2014; Maloney & McFillen, 1986; Thomas et al., 1990), though measuring safety motivation using expectancy theory to test it empirically within the safety motivation literature is not common. Researchers have examined *components* of expectancy theory in the safety motivation literature, though there has yet to be a study in the context of occupational safety to measure safety motivation with all three motivational facets (valence, instrumentality, and expectancy) as well as the resulting relationships with safety behaviors or performance.

Hewage and Ruwanpura (2006) and the corresponding dissertation by Hewage (2007) utilized expectancy theory as a framework to understand and describe the motivation of construction workers on four sites as a way to contribute to a theoretical model (Hewage &

Ruwanpura, 2006; p. 1078). The authors were interested in examining employee opinions about motivation, not measuring relationships they share with job performance or safety performance. Though they did not explicitly measure safety motivation with this framework or test it empirically, the sample of construction workers allowed for some discussion surrounding safety. To measure the three components of valence, instrumentality, and expectancy, the researchers administered a questionnaire, interviews, and work observations to measure factors they believed to capture the three components of expectancy theory. After this effort, the authors summarized the motivational findings and provided recommendations based on what they learned. For instance, the authors noted which work factors were regarded as having higher valence (i.e., "chances to learn new things"), and accordingly recommended for the construction sites samples to provide more opportunities for "learning new things" to happen in order to boost motivation. The authors did not test their measurement of expectancy theory in an empirical model, though they did draw a theoretical model including the components.

Hewage and Ruwanpura (2006) measured valence by using items assessing the participants' other sources of income, if they need to earn more money at the moment, if the company pays all the workers in a fair manner, if company rewards and salary are valuable to them, how important job satisfaction or sense of achievement is to them, and if the company treats them respectfully. Although some of these components align with the definition of valence (e.g., how important job satisfaction or sense of achievement is to them), others do not (e.g., if the company treats them respectfully). Further, the items are not targeted toward the action or behavior of "safe work" or "safety participation behavior" and so on, thus this was not measuring safety motivation. Even though these expectancy theory components are in a paper that has an emphasis on safety and a sample of construction workers, this is not a true measure of safety

motivation because the items are not specifically targeted to safety performance or safety behavior.

The authors' instrumentality items were similar in that they still somewhat aligned with the theoretical definition of instrumentality, though the authors did not utilize any safety referent within the items. The instrumentality items included those asking if the participants think the salary is matched with their effort, if management allocates rewards in a fair manner, if more performance leads to more rewards, and if they feel job satisfaction or sense of achievement after completing their work. Some of these items align with the construct of instrumentality (e.g., more performance yields more rewards) whereas others do not (e.g., if they feel job satisfaction or sense of achievement after completing their work).

Finally, the expectancy items inquired if the participants can complete the work in the given time frame, if they have past experience doing this type of work, is they are satisfied with the working conditions, how they feel about their work, and if they think that more effort leads to better performance. Again, some of the item components effectively measure expectancy as it aligns with the true theoretical definitions (e.g., if they can complete their work in the given time frame), though most of the components do not directly represent the definition of expectancy (e.g., how they feel about their work, if they have past experience with the work). Further, the items do not have a safety referent or mention safety behavior as the action or focus, thus are not safety motivation items.

Curcuruto, Parker, and Griffin (2019) examined the relationships between three facets of safety motivation on a single type of safety behavior, safety initiative, which is "the behavior through which an individual proactively takes responsibility for suggesting and promoting changes that will improve safety" (p. 1). The three facets of motivation used in the study by

Curcuruto et al. (2019) were *can do* safety motivation (role breadth self-efficacy and control beliefs), *reason to* safety motivation (internalization of safety responsibilities or psychological ownership and felt responsibility for constructive change), and *future orientation* safety motivation (anticipation and improvement orientations). The authors deliberately only isolated motivational types that would comprise a higher order construct of "proactive motivation".

Some of the motivational components were similar to the components within expectancy theory, whereas others were distinct. The motivational constructs used in Curcuruto et al. (2019) that share similarities with expectancy theory are *can do* and *reason to* motivation. The two *can do* components (self-efficacy and control beliefs) share a great deal of overlap with expectancy, because most studies examining expectancy measure whether or not the participant beliefs effort will lead to performance using items capturing capability or perceived efficacy (e.g., Vroom, Porter, & Lawler, 2015). The two *reason to* components (psychological ownership and felt responsibility) have some overlap with valence because they could be used to explain the desirability of the outcome to the participant, though this would not be a direct measure of valence because they do not directly measure the desirability of the outcomes associated with working safely. These items would more accurately resemble the "importance" construct of safety motivation that is most commonly measured in the literature. There were no components in the Curcuruto et al. (2019) study that are similar to instrumentality, and this follows the pattern of instrumentality as the least commonly represented aspect of expectancy theory in the safety motivation literature. Curcuruto et al. (2019) found each type of motivation to be significantly predictive of safety initiative (at a later timepoint). The authors did not include paths between the motivational facets and other safety behaviors in their model.

In a recent theoretical paper, Beus and Taylor (2018) proposed that an individual's decision to engage in safety-related behavior can be explained by expectancy theory. The authors outline propositions based on theory that an individual would be more likely to enact safe behaviors when the consequences are associated with high valence, high instrumentality, and high expectancy. In a safety context, valence describes an employee's view of how desirable the outcomes are that result in their safety-related behavior. The authors give an example of relationship proximity for valence, such that workers who are more familiar or closer to the targets of their safe (or unsafe) behavioral decisions (e.g., close co-workers, teammates) will most likely have higher valence towards the outcomes associated with working safely, and workers who are less familiar to the targets of their own behavior (e.g., general public, unfamiliar coworker) will have a lower valence towards working safely because the desirability of keeping the more distal targets safe is more ambiguous and feels less important.

For instrumentality, they provided the example of wearing fall protection (safety performance or compliance behavior) in preventing falls (safety outcome). High instrumentality would be the perception that wearing the fall protection would be likely to prevent falling, whereas low instrumentality would be the perception that wearing the protection is unlikely to prevent the negative outcome. For expectancy, the authors explained how the amount of resources and effort involved with performing a safety behavior can be influential, such that behaviors that are inconvenient or too difficult have low expectancy. The authors provided the example of how "certain unsafe behaviors require very little effort (e.g., using a machine with disabled safety features) while other unsafe behaviors require more effort and conscious processing (e.g., using tools to disable a machine's safety features)" (Beus & Taylor, 2018, p. 409). Because this was a theoretical paper, Beus and Taylor did not measure or empirically test

their propositions, though they firmly established the idea of expectancy theory as applicable in the context of occupational safety in a conceptually and theoretically appropriate way.

In the present study, valence, instrumentality, and expectancy will be measured along with three distinct types of safety behavior (safety initiative, safety compliance, safety participation) to be tested empirically in the same model. Valence, instrumentality, and expectancy will be measured according to definitions of expectancy theory as it was described by the original scholars on the topic (e.g., Vroom, 1964; Porter & Lawler, 1968) and in alignment with the theoretical paper by Beaus and Taylor (2018) for adaptation to the safety context. Valence, when conceptualized within the context of safety motivation for the present study, describes how the individual feels in regard to the desirability of the *outcomes* associated with the action or behavior of working safely. In the general work motivation literature, valence is conceptualized as feelings of desirability or attractiveness an individual has in respect to a given outcome associated with an action. In the present study this specific action is working safely. (Please see Table 1 for a summary of the expectancy theory components within the general work motivation literature and the present study).

Valence in the present study is different from the importance construct as mostly utilized in the safety motivation literature (i.e., which measures how important the participant feels it is to work safely). This measure will still be included, though as a separate motivational facet called “importance” because it has been demonstrated that importance and valence are distinct motivational constructs (e.g., Parker & Dryer, 1976). Instrumentality in the safety context is the extent to which a person believes working safely will result in desired outcomes like rewards and recognition. Finally, expectancy in the safety context describes an individual’s beliefs in their

ability to enact safety behaviors or to work safely. Please see the method section for a more detailed explanation of how these will be measured.

Intrinsic and Extrinsic Safety Motivation

Work or the outcomes associated with work can be intrinsic or extrinsic (e.g., Porter & Lawler, 1968; Ryan & Deci, 2000). Intrinsic reasons for behavior include satisfaction from completing the behavior itself or motivation that comes from within the person when it comes to completing a certain task or behavior, whereas extrinsic reasons for behavior come from external consequences or rewards that are associated with competing the behavior (e.g., instrumental gains and losses). Meta analytic evidence supports the notion that both intrinsic and extrinsic motivational forces are predictive of job performance, though more specifically, intrinsic motivation is related to the quality of performance whereas extrinsic motivation is related to the quantity of performance (Cerasoli, Nicklin, & Ford, 2014).

In the early expectancy theory literature, it was noted that motivational components (valence and instrumentality) could have both intrinsic and extrinsic characteristics (e.g., Lawler, 1971). This has been tested empirically, illustrating how intrinsic valence and intrinsic instrumentality more strongly predict behavior than extrinsic valence and extrinsic instrumentality (Maloney & McFillen 1986; Russo, 2017). In the present study, intrinsic valence describes the desirability the individual places on intrinsic rewards or consequences associated with working safely (e.g., sense of accomplishment, a feeling of pride) and external valence describes the desirability of the extrinsic outcomes (e.g., to avoid punishment, more pay increases) that could be the result of working safely. Intrinsic instrumentality describes an individual's belief that their safety performance will lead to an intrinsic reward (versus an extrinsic reward) and will also be measured.

Researchers have described motivational forces as intrinsic or extrinsic in the safety literature. Using Self Determination Theory as a framework to explain motivation for safe work, Scott, Fleming, and Kelloway (2014) illustrated how safety motivation can be intrinsic (the individual feels working safely is interesting, enjoyable, or satisfying; they have integrated the value of working safely into their sense of self) or extrinsic (the individual works safely to avoid punishment or ruining the safety record, or to obtain rewards such as a bonus). They found that intrinsic safety motivation was a significant predictor of both safety compliance and safety participation behavior. Safety compliance behaviors are the core activities required to maintain a minimal level of safety, such as wearing protective equipment (Neal & Griffin, 2000). Safety participation behaviors are discretionary or voluntary activities that support and encourage a safe working environment (Neal & Griffin, 2000).

These results or components of these results have since been replicated. For instance, Lim, Fang, and Wu (2018) found significant relationships between intrinsic safety motivation and safety compliance and participation. Conchie (2013) found a relationship between intrinsic safety motivation and the specific safety behaviors of whistleblowing (reporting violations; a safety compliance behavior) and safety voice (making constructive suggestions for change; a safety participation behavior). There were no significant relationships between external safety motivation and safety performance in either paper. Jiang and Tetrick (2016) found the same relationship between intrinsic safety motivation and safety behavior, but unlike the other studies, found a slight negative relationship between external motivation and compliance behavior. There was no significant relationship between external safety motivation and safety participation behavior.

The Perception of Time and Safety Motivation

The integration of the future (and the concept of time) and safety is not new, particularly the idea that future-oriented consideration contributes to safety performance. This is a commonly discussed topic when examining high reliability organizations, which are a topic of interest to safety practitioners and researchers alike. High reliability organizations (HRO) are those that engage in highly hazardous activities, yet they manage to sustain very few accidents and injuries, thus they are regarded as leaders in best safety practice (Weick & Sutcliffe, 2001). A characteristic of HROs is the emphasis on learning from all near misses and incidents in order to improve the future. This preoccupation on continual improvement is a critical component of HRO companies, thus safety success.

There are other areas where an emphasis on the future has been studied with occupational safety. For instance, Probst, Graso, Estrada, and Greer (2013) developed a personality construct called consideration of future safety consequences (CFSC) which measures the extent to which an employee considers the immediate versus the future consequences associated with their safety-related behaviors (adapted from the more general measure of consideration of future consequences; originally by Strathman, Gleicher, Boninger, & Edwards, 1994). Probst et al. (2013) found that employees with a higher consideration for future safety consequences had higher levels of safety knowledge, lower accident rates, higher probability of reporting injuries, and more likely to engage in safety-related OCBs than those with lower CFSC. CSFC would not be considered an alternative age construct because during the measurement process, participants are not asked to reflect upon their age, lifespan, work timeline, or life horizon. Rather, it examines their evaluation of the consequences associated with their safety behaviors. However, it is still a useful time-related construct examined in the occupational safety literature.

The idea of proactivity in the safety domain, which also has an emphasis on time and the future, is a more recently emerging topic of promising research. The most frequently utilized conceptualization of safety performance in the academic literature is two-dimensional (discussed further in the "Safety Motivation and Safety Performance" section of this dissertation; the two dimensions are safety compliance and safety participation). More recently, the two-dimensional understanding of safety behavior was challenged by Curcuruto, Parker, and Griffin (2018). The authors provided an argument for a third dimension of safety performance, which they refer to as safety initiative (the proactive version of safety participation), defined as is "the behavior through which an individual proactively takes responsibility for suggesting and promoting changes that will improve safety" (p. 1). They conclude by describing safety performance as a three-factor behavioral process (rather than two) including safety initiative to the original two-dimensional conceptualization of safety compliance and safety participation. This new dimension, safety initiative, integrates aspects where the future is considered more than the original two dimensions. Examples of safety initiative now include proactive behaviors such as making an effort 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 work activity. There is a focus on the pre-emptive.

Though future consequences, preoccupation with the future, and concepts of the like are an integral part of the safety domain on an intra-personal level and company level, what is lacking is an understanding of one's own personal future time perspective (the inter-personal level) as it relates to their own career timeline in conjunction with safety motivation and performance. In the present study, I plan to examine the potential influence of OFTP (i.e., Perceived Opportunities

OFTP and Remaining Time OFTP) on five components of safety motivation (i.e., intrinsic and extrinsic valence, intrinsic and extrinsic instrumentality, and expectancy).

Occupational Future Time Perspective and Motivation

Though there has yet to be research examining OFTP and safety motivation, researchers have examined OFTP and general work motivation concepts. Because some researchers have not examined OFTP as a multidimensional construct, several studies only have results for overall OFTP without specific findings for perceived opportunities and remaining time. For instance, there is a reported significant relationship between overall OFTP and achievement motivation (Rudolph et al., 2018), motivation to continue working (Kooij, Bal, & Kanfer, 2014), and learning motivation (for both PO and RT; Kochoian et al., 2017).

Treadway, Breland, Adams, and Williams (2010) investigated the relationship between OFTP and engagement with different types of networking behavior. Treadway et al. (2010) found those with a restricted OFTP were more likely to engage in networking behavior for the community (e.g., church and community groups, civic groups, social clubs) and those with an expansive OFTP were more likely to engage in career networking (e.g., professional activities, conferences). These results are consistent with Socioemotional Selectivity Theory such that as a person's time horizon decreases, they prioritize social and emotional goals. Also consistent with with SST, Kooij, de Lange, Jansen, and Dikkers (2013) found a relationship between an expansive FTP and growth motives (preference for characteristics or work outcomes that related to achievement and mastery) and esteem motives (status striving). They found limited FTP is related to generativity motives (preference for job characteristics or outcomes that pertain to sharing skills with younger generations). Finally, Kooij and Van De Voorde (2011) found that expansive FTP is related to an increase in development motives and this holds true over time

(measured a year later). They also found limited or constrained FTP as positively related to generativity motives. The last two studies by Kooij and colleagues were not explicitly measuring OFTP, though they measured traditional FTP in a work context.

Occupational Future Time Perspective and Valence

Valence, within the context of safety motivation for the present study, describes how an employee evaluates the desirability of the outcomes associated with working safely. The valence of these outcomes associated with safety performance can be both intrinsic and extrinsic. In the present study, intrinsic valence describes the desirability the individual places on intrinsic rewards or consequences associated with working safely (e.g., sense of accomplishment, a feeling of pride) and external valence describes the desirability of the extrinsic outcomes (e.g., to avoid punishment, more pay increases) that could be the result from working safely.

Based on theoretical support from Socioemotional Selectivity Theory, it would be reasonable to expect those with an expansive OFTP to have more extrinsic valence (thus a positive relationship) and those with a restricted OFTP to have more intrinsic valence (thus a negative relationship). According to the theory, when people perceive time to be more open-ended, they are more motivated by growth related goals such as promotional opportunities or advancement, which can be considered as extrinsic to the person (e.g., Lang & Carstensen, 2002). This has been demonstrated in experimental manipulations, such that when future time perspective was temporarily changed to be shorter in research participants, this made their goal pursuits less extrinsic compared to pre-intervention levels (Cozzolino, Sheldon, Schachtman, & Meyers, 2009). Finally, there is also meta analytic evidence to support an age-related decrease in extrinsic motives (Kooij et al., 2011). Thus, I hypothesize a relationship between OFTP and extrinsic or instrumental motives would occur in the safety domain as well.

Conversely, individuals with a more constricted time perspective place a higher value on emotional regulation, personal fulfillment, and intrinsic motives (e.g., Carstensen, 2006; Lang, 2000). Though outside of the workplace and safety domain, some research has shown a positive relationship between a restrictive general future time perspective and intrinsic motivation (in an academic context among younger adults; De Bilde, Vansteenkiste, & Lens, 2011). There is also meta analytic support for increasing intrinsic motivation as age increases (Kooij et al., 2011). Thus, following Socioemotional Selectivity Theory, I expect OFTP to share a relationship with both intrinsic (negative relationship) and extrinsic safety valence (positive relationship). Please see Figure 1 for an illustration of where Hypotheses 1 and 2 exist within the first model and please see Table 2 for a list of each hypothesis and the corresponding independent and dependent variables.

Hypothesis 1: Perceived Opportunities OFTP will be negatively related to intrinsic valence of safety outcomes (H1a) and positively related to extrinsic valence of safety outcomes (H1b).

Hypothesis 2: Remaining Time OFTP will be negatively related to intrinsic valence of safety outcomes (H2a) and positively related to extrinsic valence of safety outcomes (H2b).

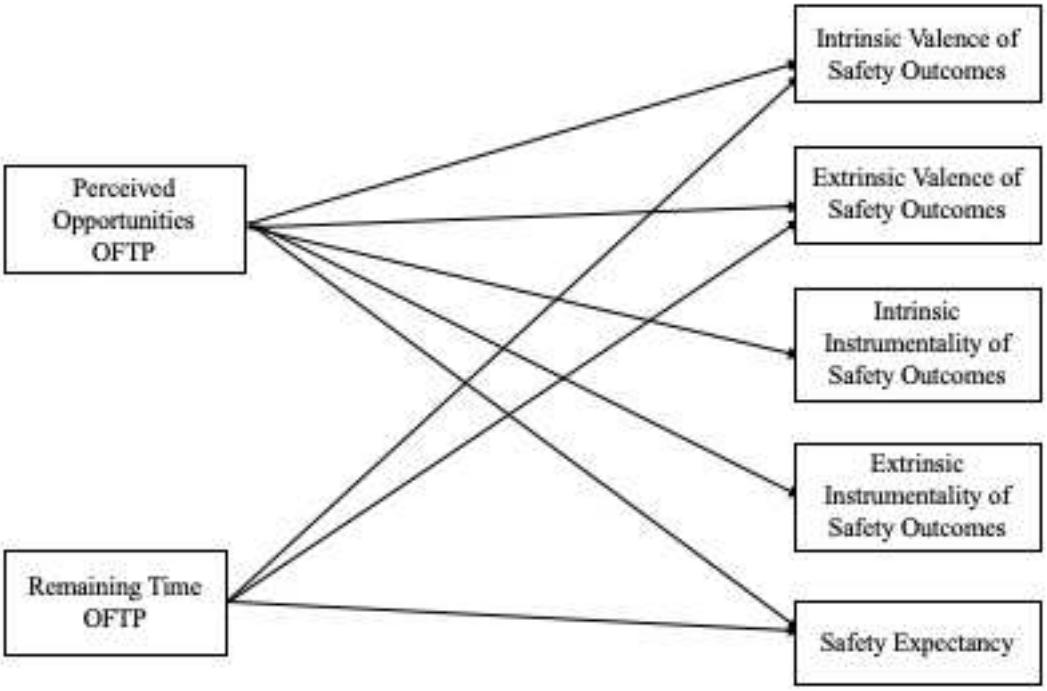

Figure 1. Model 1. Direct relationships within Model 1 between the occupational future time perspective dimensions and the safety motivation components

Table 2
Hypotheses with Corresponding Independent and Dependent Variables

Hypothesis	Independent Variables	Dependent Variables
Hypothesis 1: Perceived Opportunities OFTP will be negatively related to intrinsic valence of safety outcomes (H1a) and positively related to extrinsic valence of safety outcomes (H1b).	PO-OFTP	Intrinsic Valence of Safety Outcomes; Extrinsic Valence of Safety Outcomes
Hypothesis 2: Remaining Time OFTP will be negatively related to intrinsic valence of safety outcomes (H2a) and positively related to extrinsic valence of safety outcomes (H2b).	RT-OFTP	Intrinsic Valence of Safety Outcomes; Extrinsic Valence of Safety Outcomes
Hypothesis 3: Perceived Opportunities OFTP will be positively related to both (H3a) intrinsic instrumentality of safety outcomes and (H3b) extrinsic instrumentality of safety outcomes.	PO-OFTP	Intrinsic Instrumentality of Safety Outcomes; Extrinsic Instrumentality of Safety Outcomes
Hypothesis 4: Perceived Opportunities OFTP will be positively related to safety expectancy.	PO-OFTP	Safety Expectancy
Hypothesis 5: Remaining Time OFTP will be positively related to safety expectancy.	RT-OFTP	Safety Expectancy
Hypothesis 6: The relationship between Perceived Opportunities (PO-OFTP) and components of safety motivation will be moderated by safety climate such that the relationship between PO-OFTP and (H6a) intrinsic valence of safety outcomes, (H6b) extrinsic valence of safety outcomes, (H6c) intrinsic instrumentality of safety outcomes, (H6d) extrinsic instrumentality of safety outcomes, and (H6e) safety expectancy will be weaker when employees perceive to be working in a positive safety climate (and stronger when they perceive to be working in a weaker safety climate).	PO-OFTP (IV); Safety Climate (Moderator)	Intrinsic Valence of Safety Outcomes; Extrinsic Valence of Safety Outcomes; Intrinsic Instrumentality of Safety Outcomes; Extrinsic Instrumentality of Safety Outcomes; Safety Expectancy
Hypothesis 7: The relationship between Remaining Time (RT-OFTP) and components of safety motivation will be moderated by safety climate such that the relationship between RT-OFTP and (H7a) intrinsic valence of safety outcomes, (H7b) extrinsic valence of safety outcomes, and (H7c) safety expectancy will be weaker when employees perceive to be working in a positive safety climate (and stronger when they perceive to be working in a weaker safety climate).	RT-OFTP (IV); Safety Climate (Moderator)	Intrinsic Valence of Safety Outcomes; Extrinsic Valence of Safety Outcomes; Safety Expectancy

Hypothesis 8: There will be a positive relationship between valence of safety outcomes and safety compliance (H8a), safety participation (H8b), and safety initiative (H8c).	Valence of Safety Outcomes	Safety Compliance; Safety Participation; Safety Initiative
Hypothesis 9: There will be a positive relationship between instrumentality of safety outcomes and safety compliance (H9a), safety participation (H9b), and safety initiative (H9c).	Instrumentality of Safety Outcomes	Safety Compliance; Safety Participation; Safety Initiative
Hypothesis 10: There will be a positive relationship between expectancy and safety compliance (H10a), safety participation (H10b), and safety initiative (H10c). These relationships will be stronger between expectancy and safety participation and initiative (the two types of citizenship performance) than between expectancy and safety compliance (task-related performance; H10d).	Safety Expectancy	Safety Compliance; Safety Participation; Safety Initiative
Hypothesis 11: There will be a positive relationship between safety importance and safety compliance (H11a), safety participation (H11b), and safety initiative (H11c). The relationship between importance and compliance will be stronger than the relationships between importance and the two types of safety citizenship-related behavior (performance and safety initiative; H11d).	Safety Importance	Safety Compliance; Safety Participation; Safety Initiative
Hypothesis 12: There will be a significant relationship between Perceived Opportunities OFTP and safety compliance.	PO-OFTP	Safety Compliance
Hypothesis 13: Both (H13a) Perceived Opportunities OFTP and (H13b) Remaining Time OFTP will be positively related to safety participation, though (H13c) PO-OFTP will have a stronger relationship with safety participation than RT-OFTP.	PO-OFTP; RT-OFTP	Safety Participation
Hypothesis 14: Both (H14a) PO-OFTP and (H14b) RT-OFTP will be positively related to safety initiative, though (H14c) RT-OFTP will have a stronger relationship with safety initiative than PO-OFTP.	PO-OFTP; RT-OFTP	Safety Initiative
Research Question 1: There will be a positive relationship between intrinsic valence of safety outcomes and (RQ1a) safety compliance, (RQ1b) safety participation, (RQ1c) and safety initiative. The relationships between intrinsic valence of safety outcomes and the two types of citizenship performance (safety participation and safety initiative) will be stronger than the relationship between intrinsic valence and safety compliance (task-related performance) (RQ1d).	Intrinsic Valence of Safety Outcomes	Safety Compliance; Safety Participation; Safety Initiative

Research Question 2: There will be a positive relationship between extrinsic valence of safety outcomes and safety compliance.	Extrinsic Valence of Safety Outcomes	Safety Compliance
Research Question 3: There will be a positive relationship between intrinsic instrumentality of safety outcomes and (RQ3a) safety compliance, (RQ3b) safety participation, (RQ3c) and safety initiative. The relationships between intrinsic instrumentality of safety outcomes and the two types of citizenship performance (safety participation and safety initiative) will be stronger than the relationship between intrinsic instrumentality and safety compliance (task-related performance) (RQ3d).	Intrinsic Instrumentality of Safety Outcomes	Safety Compliance; Safety Participation; Safety Initiative
Research Question 4: There will be a positive relationship between extrinsic instrumentality of safety outcomes and safety compliance.	Extrinsic Instrumentality of Safety Outcomes	Safety Compliance

Note. PO-OFTP = perceived opportunities occupational future time perspective; RT-OFTP = remaining time occupational future time perspective

Occupational Future Time Perspective and Instrumentality

Instrumentality in the present study (within the safety context) is the extent to which a person believes working safely will result in desired outcomes like rewards and recognition. In the present study, like valence, instrumentality can be intrinsic or extrinsic. Intrinsic instrumentality describes an individual's belief that their safety performance will lead to an intrinsic reward whereas extrinsic instrumentality describes an individual's belief that their safety performance will lead to an extrinsic reward.

Instrumentality is more influenced by factors external to the employee than valence or expectancy (Vroom, 1964). Whether or not someone believes their behavior will result in the desired outcomes can often times be contingent upon how much they trust their manager, how much autonomy or control they have over the situation, if conditions are predictable and fair, and other available resources (such as the company's finances) that are out of the employee's control

(e.g., Lawler, 1971). When considering the two dimensions of OFTP, the Perceived Opportunities dimensions has been shown as more externally influenced than the Remaining Time dimension (e.g., Rudolph et al., 2018), thus it is possible PO would have a stronger relationship with instrumentality than RT.

Hypothesis 3: Perceived Opportunities OFTP will be positively related to both (H3a) intrinsic and (H3b) extrinsic instrumentality of safety outcomes.

Occupational Future Time Perspective and Expectancy

Expectancy in the safety context describes an individual's beliefs in their ability to enact safety behaviors or to work safely. Expectancy is defined by the person's assessment of their *own* effort or ability in the performance required to obtain the outcome (Vroom, Porter, & Lawler, 1971). Thus, this is more internal to the person than instrumentality, which is more influenced by external factors. The related concept of self-efficacy is commonly discussed as an important determinant in the lifespan motivational literature such that higher levels of self-efficacy are associated with higher levels of motivation and performance (e.g., Kooij & Kanfer, 2019). There are a number of ways self-efficacy decreases with age. This might occur due to many reasons including loss of physical abilities and fluid intelligence, exposure to harmful stereotypes, and less opportunities for learning and development (Fisher, Chaffee, Tetrick, Davalos, & Potter, 2017; Rosen & Jerdee, 1976). It also could be due to older workers feeling they have less time in the work life, thus feeling less able to accomplish their goals (Kooij et al., 2008). Fortunately, there are ways to promote or build self-efficacy that might be lost through a variety of approaches such as job crafting, skill building and training (Kooij et al., 2017).

Within the OFTP research literature, constructs that are somewhat similar to expectancy have been examined such as general self-efficacy and occupational self-efficacy. Though it has

not been measured in the context of safety, a similar construct to expectancy is occupational self-efficacy. It is defined as the confidence one has in performing the tasks related to their own job (Rigotti, Schyns, & Mohr, 2008). Park and Jung (2015) demonstrated there is a strong significant relationship between a more expansive FTP and higher occupational self-efficacy. The authors examined FTP as a unidimensional construct. They attribute this relationship to those with higher FTP seeing the importance of future goals, working harder to develop the skills needed to achieve them, and through this process it builds self-efficacy.

Hypothesis 4: Perceived Opportunities OFTP will be positively related to safety expectancy.

Hypothesis 5: Remaining Time OFTP will be positively related to safety expectancy.

Occupational Future Time Perspective and Safety Importance

To my knowledge there has yet to be a study examining OFTP with safety importance motivation. However, it has been demonstrated there is not a significant relationship between chronological age and safety importance perceptions (Hanscom & Cleveland, 2019). Though the research to support a relationship between OFTP and safety importance is limited, it could be surmised there would also be a lack of evidence to support a relationship between OFTP and safety importance (because OFTP is closely related to age).

The Role of Safety Climate in the Relationship between Occupational Future Time Perspective and Safety Motivation

A more recent trend in the motivational research literature is to consider the role of the context in how employees form motivation (Diefendorff & Chandler, 2011). Originally, motivation scholars were primarily concerned with the individual (more person-centric) while studying motivation. However, over time researchers have recognized the important role the context plays within these forces in conjunction with individual differences (e.g., Vinchur &

Koppes, 2011). Many scholars have acknowledged the role of the context in workplace motivation and have called for more multilevel research to understand how the environment in which work is performed affects different components of work motivation (Kanfer et al., 2017).

In the present study, the social context of safety climate is examined to better understand the influence of OFTP (an individual difference variable) on motivational components as defined by expectancy theory. In a theoretical paper, Lloyd and Maertens (2018) hypothesized that as a social context becomes more positive, worker motivation should increase, whereas when a social context is more negative, this would result in a decrease of worker motivation. They drew on past research, such as the Hawthorne Studies conducted by Mayo and colleagues, which illustrated that employees can only be studied within the larger environment of their role within a group or context to best understand motivation. Because groups hold significant cues, norms, and expectations, these influence the motivation and behavior of individual members. Lloyd and Mertens (2018) conclude with the notion that individual motivation, particularly that of expectancy theory, must be considered within the perspective of external situations and they call for more research to examine this topic with specific social contexts.

Safety climate is a type of a shared context (Zohar, 2010). Safety climate is the shared perceptions employees have regarding the relative importance of safe conduct in their workplace (Zohar, 1980). This also includes the procedures, policies, routines, and behaviors that get rewarded or the behaviors that are expected (Casey, Griffin, Harrison, & Neal, 2017). Motivational researchers have explained how the context can moderate the influence of individual differences on motivation (Chen & Kanfer, 2006). This has yet to be extended to connect the concepts of time perspective and safety motivation, though it could be possible to make hypotheses about these potential relationships using research and theory on situational

strength (Meyer, Dalal, & Hermida, 2010). Situational strength can be described by contexts that are weak and strong. Strong contexts are those in which individuals have little behavioral discretion, and as a result, individual differences are inhibited and less behavioral differences emerge (Meyers et al., 2010). Situational strength is defined by cues provided by people in the environment that illustrate expectations to guide behavior. Safety climate can be understood in terms of situational strength. For instance, Lee and Dalal (2014) have conceptualized positive safety climates as strong situations, because there are stronger norms and cues for safe behavior, thereby restricting the opportunity for individual differences to play a role in outcomes.

It is not yet clear how situational strength moderates the relationship between personality and motivation, and scholars have called for more research on this topic (Meyer & Dalal, 2010). Extending this to the present study, I would expect for those working in a positive safety climate (strong situational strength) to have non-significant or weaker relationships between their occupational future time perspective and motivational components because in strong situations, less of the individual comes out. Alternatively, those working in weaker safety climates will have more defined relationships between OFTP and components of motivation because those are situations in which individual differences play more of a role (Lee & Dalal, 2014). Thus, regardless of the amount of perceived opportunities and remaining time someone feels they have left, if they are working within a positive safety climate, this is going to result in somewhat positive motivation (in terms of valence, instrumentality, and expectancy). Conversely, those in a weaker or more negative safety climate will show more differences in motivation (in terms of valence, instrumentality, and expectancy) across different levels of perceived opportunities and remaining time left. Please see Figure 2 for these modeled relationships.

Hypothesis 6: The relationship between Perceived Opportunities (PO-OFTP) and components of safety motivation will be moderated by safety climate such that the relationship between PO-OFTP and (H6a) intrinsic valence of safety outcomes, (H6b) extrinsic valence of safety outcomes, (H6c) intrinsic instrumentality of safety outcomes, (H6d) extrinsic instrumentality of safety outcomes, and (H6e) safety expectancy will be weaker when employees perceive to be working in a positive safety climate (and stronger when they perceive to be working in a negative safety climate).

Hypothesis 7: The relationship between Remaining Time (RT-OFTP) and components of safety motivation will be moderated by safety climate such that the relationship between RT-OFTP and (H7a) intrinsic valence of safety outcomes, (H7b) extrinsic valence of safety outcomes, and (H7c) safety expectancy will be weaker when employees perceive to be working in a positive safety climate (and stronger when they perceive to be working in a negative safety climate).

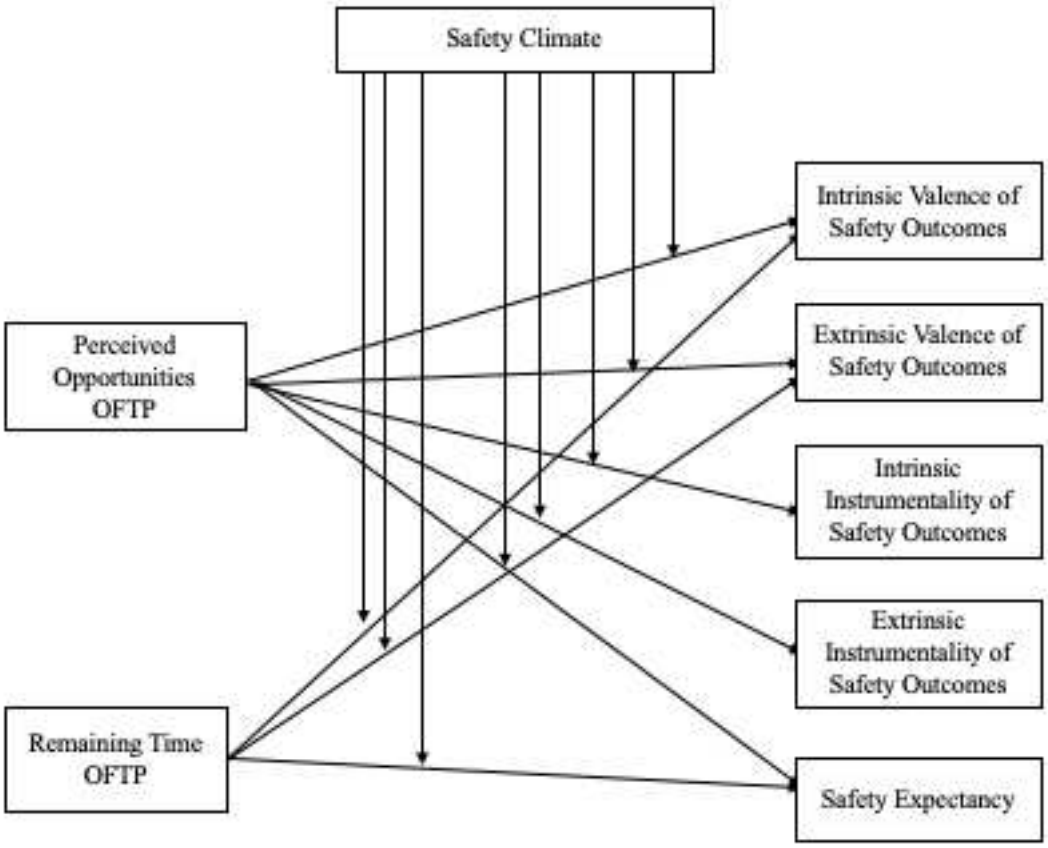

Figure 2. Model 2: The moderating effect of safety climate between occupational future time perspective and the safety motivation components

Safety Motivation and Safety Performance

Most commonly in the safety motivation and safety behavior literature, safety performance behaviors are described in terms of safety compliance and safety participation. Safety compliance, akin to task performance, consists of behaviors in which employees conform or submit to safety expectations, rules, and procedures (Neal & Griffin, 1997; Griffin & Neal, 2000). Examples of safety compliance behaviors are wearing personal protective equipment and engaging in standard work practices. Safety participation behaviors, sometimes referred to as safety citizenship behaviors, are more similar to contextual performance and are comprised of discretionary behaviors that go beyond safety compliance (Neal & Griffin, 1997; Griffin & Neal, 2000). Examples of safety participation behaviors include those such as attending non-mandatory

safety meetings, helping a coworker with safety-related matters, and anything that does "not directly contribute to an individual's personal safety but that do help to develop an environment that supports safety" (Neal & Griffin, 2006; p. 947). These are both empirically distinct factors of safety performance (e.g., Neal & Griffin, 1997) and are both associated with fewer accidents and injuries on the job (Christian et al., 2009; Neal, Griffin, & Hart, 2000).

How the concept of safety performance has expanded. Hoffman, Mergeson, & Gerras (2003) more thoroughly defined and expanded safety participation behaviors by drawing from the broader job performance literature on contextual performance or organizational citizenship behaviors, which are voluntary helping behaviors not assigned as required or contractual tasks that promote coworkers or the company (Organ, 1988). In the context of safety, Hoffman et al. (2003) described safety participation behaviors by the following dimensions: helping (e.g., volunteering for safety committees, helping teach safety procedures to new crew members), voice (e.g., speaking up and encouraging others to get involved in safety issues, expressing opinions on safety matters even if others disagree), stewardship (e.g., going out of my way to look out for the safety of other crew members, taking action to protect other crew members from risky situations), whistleblowing (e.g., explaining to other crew members that I will report safety violations, telling other crew members to follow safe working procedures), civic virtue (e.g., attending safety meetings, attending nonmandatory safety-oriented meetings), and initiating safety-related change (e.g., trying to improve safety procedures, trying to change the way the job is done to make it safer).

The two-dimensional understanding of safety behavior was challenged by Curcuruto, Parker, and Griffin (2018). The authors contested the measurement and conceptualization of safety participation, arguing that past researchers have missed the complexity of the construct

and incorrectly combine both active and passive forms. They provide the example of how safety participation was conceptualized in the seminal meta-analysis by Christian et al. (2009), where the authors combined the passive forms of safety participation (e.g., helping, communication, civic virtue) with the more proactive forms of safety participation (e.g., initiating safety-related changes) into a single construct. Curcuruto et al. (2018) demonstrate these "passive" and "active" forms of safety participation are in fact empirically distinct, thus challenging the notion of the two-dimensional understanding. The authors provided an argument for a third dimension of safety performance, which they refer to as safety initiative (the proactive version of safety participation), defined as is "the behavior through which an individual proactively takes responsibility for suggesting and promoting changes that will improve safety" (p. 1). They conclude by describing safety performance as a three-factor behavioral process including safety compliance, safety participation, and safety initiative. Examples of safety participation include assisting others to help them perform safe work, helping others with safety-related responsibilities, and getting involved in safety-related activities. Examples of safety initiative include making an effort 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 work activity.

The Present Study

Though there is an established relationship between safety motivation and safety performance when motivation is measured using Griffin and Neal's importance items, there has yet to be substantial evidence to describe the relationship between additional safety motivation conceptualizations with safety compliance, safety participation, and safety initiative behaviors. The present study will extend previous research on safety motivation and behavior to examine

these relationships using a more comprehensive understanding of safety motivation (expectancy theory, as requested by Beus & Taylor, 2018) and safety behavior (as requested by Curcuruto et al., 2018).

In a previous section I made the case as to why it is important to study multiple conceptualizations of safety motivation. For similar reasons, it is important to study multiple types of safety performance as well. Similar to motivation, job performance is a complex and multidimensional construct that is difficult to measure. By measuring multiple facets or types of job performance, we are able to better understand it as the criterion (Wildman et al., 2011). This extends to the realm of safety performance, because safety behaviors are a subset of job performance behaviors (Casey et al., 2017). It is now particularly important for both empirical and practical reasons to measure the three different types of safety behavior when determining safety performance because these have been shown to have distinct antecedents and outcomes (Curcuruto et al., 2019). Based on additional previous research, there is further evidence to support the notion that safety motivation has differential effects on varying types of safety behavior. For instance, in the longitudinal study by Neal and Griffin (2006), it was found that there is a lagged effect of safety motivation on safety participation, but this same lagged effect does not emerge for safety compliance. By examining the different relationships associated with safety performance, safety managers could recognize that what is needed to motivate one type of safety behavior might be different than what is required for another (Curcuruto et al., 2019).

Valence Safety Motivation

Based on theory and previous research, I expect valence, instrumentality, and expectancy to each be associated with safety performance. Each of these motivational facets have been shown to influence job performance outside of the safety literature (e.g., Lawler & Suttle, 1973) and there is theoretical support for this to extend to other contexts such as safety performance (e.g., Beus & Taylor, 2018; Vroom, 1964).

It has been demonstrated when employees perceive highly desirable (high valence) end goals or outcomes associated with job performance, they are more likely to feel motivated to perform and put in more effort (Maloney & McFillen, 1986; Ruso, 2017). It has also been suggested in past research to make the valence as strong as possible to make work more satisfying and improve performance (e.g., Maloney & McFillen, 1985). Though this has not been tested for safety-related valence, it has been suggested that the motivating power of working safely could be influenced by how desirable the outcomes are (Beus & Taylor, 2018). For example, when individuals place more value on individuals who are affected by their safe or unsafe behavior (e.g., when they value or have higher quality relationships with their coworkers who might be impacted by the outcomes of their actions), they are more likely to work safely (Yagil & Luria, 2010). Though not directly measuring valence, this finding supports the view that outcome desirability could influence safety performance. Please see Figure 3 for these modeled relationships.

Hypothesis 8: There will be a positive relationship between valence of safety outcomes and safety compliance (H8a), safety participation (H8b), and safety initiative (H8c).

Instrumentality Safety Motivation

Behaviors with higher instrumentality have more motivational force than those with lower perceived instrumentality (Van Eerde & Thierry, 1996). When an employee has confidence that their effort will result in desirable outcomes such as monetary rewards, the potential for recognition, and feelings of accomplishment, this has been shown to be related to job performance (Maloney & McFillen, 1986). Conversely, when employees feel their efforts will be futile, it is more unlikely they will be motivated to perform (Lawler & Suttle, 1973). Though performance relationships have not yet specifically been tested for safety-related instrumentality, it has been suggested as a theoretical proposition that an individual should have greater motivation to engage in safety behavior if they perceive high instrumentality for working safely (Beus & Taylor, 2018).

Hypothesis 9: There will be a positive relationship between instrumentality of safety outcomes and safety compliance (H9a), safety participation (H9b), and safety initiative (H9c).

Expectancy Safety Motivation

Expectancy is significantly related to the quality and quantity of self-reported job performance and effort (Maloney & McFillen, 1986). This concept has also been studied in the safety literature, such that if an employee feels capable or has the means to work safely, they will be more likely to do so. Curcuruto et al. (2019) demonstrated a significant positive relationship between employees' safety-related self-efficacy and internal control beliefs with safety compliance, safety helping, and safety initiative. In addition, Katz-Navon, Naveh, and Stern (2007) demonstrated in a sample of nurses that one's belief in their own ability to assure patient safety was associated with less treatment errors. These results suggest if employees feel they are

not capable of performing the behaviors, it is unlikely they will be motivated to engage in safety performance.

Further, it is possible safety-related expectancy will have stronger relationships with some types of safety performance than others. Curcuruto et al. (2018) reported correlative relationships between self-efficacy beliefs and the three types of safety performance at two time points (participants provided safety performance data 18 months later). During Time 1, self-efficacy beliefs shared a significant correlation with all three types of safety performance; however, there was a stronger correlation between self-efficacy and both types of citizenship-related performance (safety initiative, $r = .28$, $p < .01$; safety participation, $r = .20$, $p < .01$) than between self-efficacy beliefs and compliance behaviors ($r = .14$, $p < .05$). During Time 2, self-efficacy beliefs no longer shared a significant relationship with safety compliance. Though there was still a relationship between self-efficacy beliefs and both safety initiative ($r = .26$, $p < .01$) and safety participation ($r = .19$, $p < .01$) at Time 2. Based on these previous findings, I would expect safety-related expectancy to share relationships with all three types of safety performance, though the relationship between expectancy and compliance will be weakest.

Hypothesis 10: There will be a positive relationship between expectancy and safety compliance (H10a), safety participation (H10b), and safety initiative (H10c). These relationships will be stronger between expectancy and safety participation and initiative (the two types of citizenship performance) than between expectancy and safety compliance (task-related performance; H10d).

Safety Importance

Previous researchers have demonstrated when safety motivation is measured using the importance perspective (e.g., using the items by Neal, Griffin, & Hart, 2000), this is significantly related to both safety compliance and safety participation behavior; however, the effect sizes are

larger for safety compliance (e.g., Neal & Griffin, 2006; Neal, Griffin, & Hart, 2000). Fewer studies have examined safety motivation with safety initiative because it is more newly established as a dimension of safety performance. Zacharatos, Barling, and Iverson (2005) measured importance safety motivation, safety compliance, and safety initiative in their study. Safety importance was shown to be significantly correlated to both safety compliance (r = .55) and safety initiative (r = .38).

Examining the relationships between safety importance and safety performance is not novel, thus would be considered a replication hypothesis. However, comparing the relationships between safety importance and the other facets of safety motivation in the present study (i.e., intrinsic and extrinsic safety valence, intrinsic and extrinsic safety instrumentality, and expectancy) with safety performance offers a novel contribution. In the present study, I hypothesize the safety-related VIE components will share stronger relationships with citizenship-related safety performance (initiative and participation) and weaker relationships with safety compliance based on previous studies using variables similar to expectancy theory components. For instance, Curcuruto et al. (2019) examined a motivational component similar to expectancy (self-efficacy and control beliefs) and found the relationships to be stronger with participation and initiative than the relationship it shared with compliance. Further, studies have shown variables such as locus of control and self-efficacy (conceptually more similar to safety expectancy than safety importance perceptions) share stronger relationships with safety participation than safety compliance, whereas variables like importance share stronger relationships with compliance than safety participation (Christian et al., 2009).

Hypothesis 11: There will be a positive relationship between safety importance and safety compliance (H11a), safety participation (H11b), and safety initiative (H11c). The relationship

between importance and compliance will be stronger than the relationships between importance and the two types of safety citizenship-related behavior (performance and safety initiative; H11d).

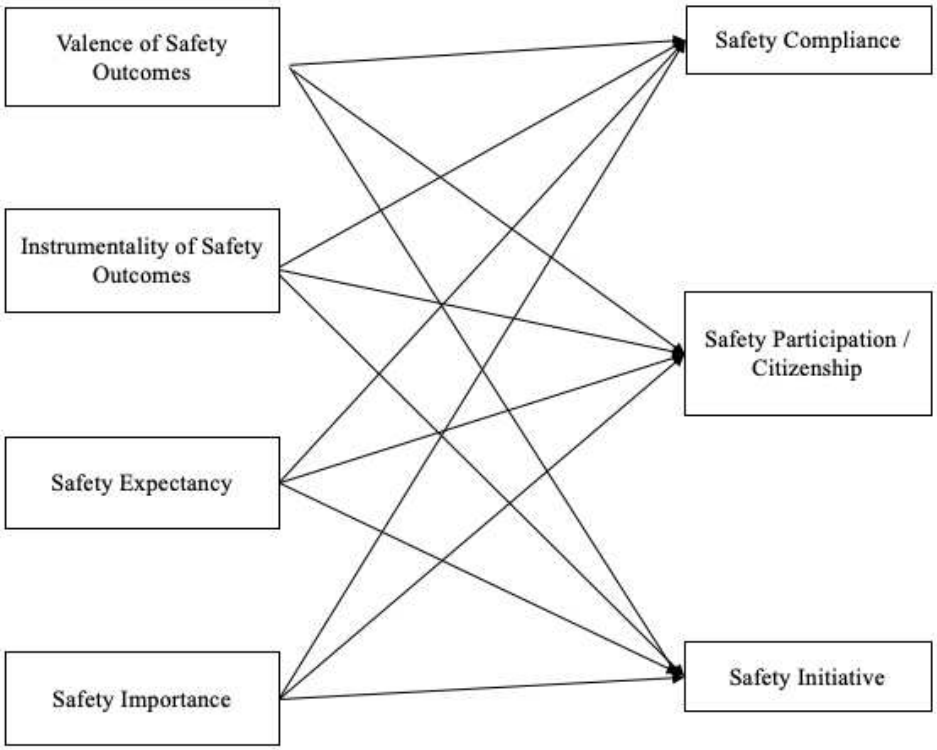

Figure 3. Model 3: Relationships between safety motivation and safety performance.

Occupational Future Time Perspective and Safety Performance

Chronological Age and Safety

Although there is some evidence to support age differences in safety, the majority of research suggests there are more similarities than differences across age groups. For instance, younger workers are more likely to suffer from injuries related to lack of job knowledge (Chau et al., 2007), whereas older workers suffer from more severe injuries and require longer time for recovery than younger workers (Peng & Chan, 2019). Yet despite the differences that exist in the severity of the injuries, the majority of the research supports age variation to be non-significant

in overall numbers (controlling for tenure; Chau et al., 2010; Ng & Feldman, 2008; or the cause of the injury is considered; Chau et al., 2007). When age relationships are found concerning safety issues, the variance can be accounted for by other factors such as tenure, differences in training, or health. Because alternative age measures better capture these external factors outside of age, Occupational Future Time Perspective is a suitable contribution to the literature to better understand safety.

Occupational Future Time Perspective and Safety

To my knowledge, there has yet to be a study examining OFTP with safety motivation or safety performance. However, there has been some research investigating the relationships between general future time perspective and behaviors that are potentially indicative of safety, though not in the work context. For instance, Zimbardo, Keough, and Boyd (1997) showed there is a link between present time perspective and risky driving, such that those with a future time perspective are less likely to engage in risky driving behaviors than those with a present time perspective (even after controlling for sensation seeking, impulsivity, and aggression). Future time perspective has also been related to more seatbelt use and more personal health behaviors (e.g., drug use, exercise; Daugherty & Brase, 2009) and general risk-taking behavior across several different domains such as financial/gambling, ethical, and social (Jochemczyk, Pietrzak, Buczkowski, Stolarski, & Markiewicz, 2017).

In a recent study, Yuan et al. (2018) examined the relationship between mortality cues (external stimuli that serve as a reminder of death) and safety performance at work. Mortality cues were measured as traumatic job stressors that pose threats to the well-being of the employee's life and others around them. Although they did not specifically measure FTP, the mortality cues are peripherally related to time perspective because those who experience more

mortality cues are more likely to reflect on their future and death (Yuan et al., 2018). This is particularly important to those working in safety-critical industries that are exposed frequently to life threatening risks and hazards. The authors found when individuals report higher levels of mortality cues, this is associated with a decrease in safety performance. Safety performance was measured using a combination of compliance and citizenship behaviors. These findings from the general FTP literature and from mortality cues would suggest those with a more expansive OFTP would engage in more safety-related behaviors than those with a more restricted OFTP, though safety performance is multidimensional, thus more nuanced than the presence and absence of risky behavior or a composite safety performance measure.

In the present study, occupational future time perspective is applied to the context of occupational safety to evaluate the relationship it potentially shares with safety motivation and safety performance. Each type of safety performance offers important contributions to occupational safety. There is no question high levels of safety performance are critical to employee safety, wellness, and financial consequences (e.g., insurance rates, loss of hours). Thus, if there was the potential for an age-related individual difference construct such as OFTP to predict safety behavior, this would be important to better understand.

Occupational Future Time Perspective and Safety Compliance

Safety compliance, akin to task performance, consists of behaviors in which employees conform or submit to safety expectations, rules, and procedures (Neal & Griffin, 1997; Griffin & Neal, 2000). Examples of safety compliance behaviors are wearing personal protective equipment and engaging in standard work practices. Because there has yet to be research examining OFTP in conjunction with safety performance, research on more general job performance can be consulted for guidance. Meta analytic evidence shows there is a relationship

between OFTP and both task and contextual performance, but the relationships are stronger for contextual performance (which is more theoretically similar to safety participation) than task performance (which is more theoretically similar to safety compliance; Rudolph et al., 2018). At the dimensional level of OFTP, the perceived opportunities (PO) dimension was the only OFTP dimension significantly related to task performance (RT was not). Based on these findings, it could be reasonable to hypothesize a significant relationship between PO-OFTP and safety compliance.

Hypothesis 12: There will be a significant relationship between Perceived Opportunities OFTP and safety compliance.

Occupational Future Time Perspective and Safety Participation

Safety participation behaviors, sometimes referred to as safety citizenship behaviors, are more reminiscent of contextual performance and are comprised of discretionary behaviors that go beyond safety compliance (Neal & Griffin, 1997; Griffin & Neal, 2000). Examples of safety participation behaviors include those such as attending non-mandatory safety meetings, helping a coworker with safety-related matters, and anything that supports the overall environment of safety beyond only directly contributing to the individual's personal benefit (Neal & Griffin, 2006).

The relationship between OFTP and contextual performance (which is theoretically similar to safety participation) is stronger than the relationship between OFTP and task performance (which is theoretically similar to safety compliance; Rudolph et al., 2018). At the dimensional level, both Perceived Opportunities and Remaining Time were significantly related to contextual performance, though Perceived Opportunities was more strongly related to contextual performance ($\rho = 0.28$) than perceived remaining time ($\rho = 0.13$). Though this was not measured

in the context of occupational safety, from these more general job performance relationships I hypothesize OFTP to share relationships with safety participation.

Hypothesis 13: Both (H13a) Perceived Opportunities OFTP and (H13b) Remaining Time OFTP will be related to safety participation, though (H13c) PO-OFTP will have a stronger relationship with safety participation than RT-OFTP.

Occupational Future Time Perspective and Safety Initiative

Safety initiative is the more active form of citizenship behavior in which an individual proactively contributes to the safety environment by making an effort to suggest and promote changes for safety improvement (Curcuruto et al., 2018). There is a future-oriented aspect of the safety initiative definition that safety participation does not emphasize. Examples of safety initiative now include making an effort 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 work activity.

Because the more specific citizenship behavior construct of initiative-related performance has not been studied with OFTP, there is little research to draw conclusions from. However, constructs with some conceptual overlap have been examined. Open-ended OFTP has been shown to be related to other proactive work-related behaviors such as job crafting (Kooij, Tims, & Akkermans, 2017). Job crafting is a work behavior in which a person self-initiates change, anticipatory action, and regulates their own work environment (Parker & Collins, 2010). Further, open-ended OFTP shares a meaningful relationship with generativity motives (Kooij & Van De Voorde, 2011), which like safety initiative, have a future-oriented component of trying to better the future for others.

Theoretically, safety initiative is more similar to safety participation because these are both citizenship behaviors (e.g., Curcuruto et al., 2018). Thus, it could be hypothesized that OFTP will share similar relationships with initiative behaviors as it does with participation behaviors. Further, because there is a time component involved with the construct of initiative, it could be expected that the relationship between RT-OFTP and safety initiative would be stronger than the potential relationship between PO-OFTP and safety initiative (which is hypothesized to be more moderate).

Hypothesis 14: Both (H14a) PO-OFTP and (H14b) RT-OFTP will be related to safety initiative, though (H14c) RT-OFTP will have a stronger relationship with safety initiative than PO-OFTP.

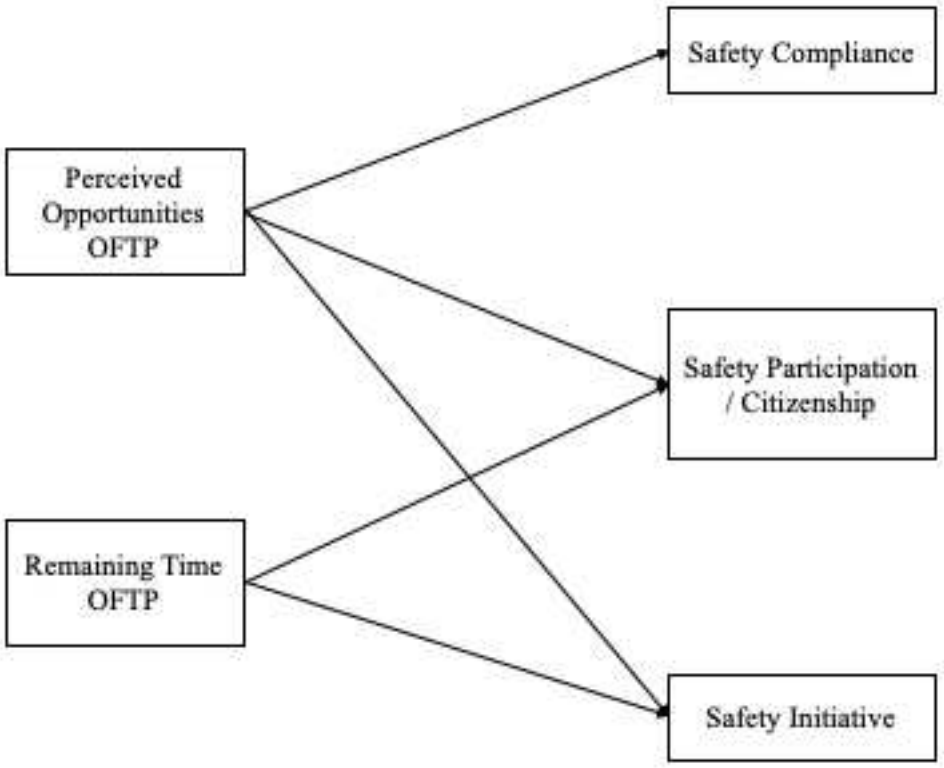

Figure 4. Model 4: Direct relationships between occupational future time perspective dimensions and safety performance

Research Questions

I expect whether or not the valence and instrumentality are intrinsic or extrinsic to play a role in the relationships between motivation and performance. Although most of the relationships in the present study have not yet been tested, there have been previous findings that could guide expectations in the present context. There is evidence from the safety literature to suggest that intrinsic motivation shares a stronger relationship with safety performance than extrinsic motivation. For instance, Lim, Fang, and Wu (2018) found significant relationships between intrinsic safety motivation and both safety participation and compliance. No significance was found for extrinsic safety motivation. Conchie (2013) found a relationship between intrinsic safety motivation and the specific safety behaviors of whistle-blowing (reporting violations; a safety compliance behavior) and safety voice (making constructive suggestions for change; a safety participation behavior). There were no significant relationships between external motivation and safety compliance or participation.

There is also evidence to suggest the relationship between intrinsic types of motivation and safety performance will vary by the type of performance, such that it will be stronger for participation and initiative safety behaviors than compliance safety behavior. There are several studies that illustrate a significant relationship between intrinsic motivation and safety performance (i.e., participation and compliance), though the effect sizes are larger for the relationship between intrinsic motivation and safety participation than with safety compliance (e.g., Jiang & Tetrick, 2016; Lim, Fang, & Wu, 2018). An argument as to why intrinsic motivation should be more strongly related to safety participation behavior than compliance behavior is due to the parallels these types of safety behavior share with general organizational citizenship and task performance. It has been demonstrated that intrinsic motivation shares a

stronger relationship with organizational citizenship behavior than extrinsic motivation (e.g., Finkelstein, 2011), and because safety participation behavior and safety initiative behavior are comprised of citizenship behaviors, it is reasonable to hypothesize the same would hold true for intrinsically motivated valence and instrumentality and the relationships with safety citizenship performance. It has been suggested that because safety participation is comprised of citizenship behaviors, and these acts have the potential to stimulate employees with interest, autonomy, and enthusiasm, this would warrant stronger relationships with intrinsic motivation than safety compliance, which is comprised of task behaviors (Conchie, 2013). For instance, Conchie (2013) illustrated how leaders influence employees' proactive safety behaviors through increasing the employees' intrinsic motivation.

Whereas intrinsic motivation shares significance with both safety compliance and participation, research has suggested that extrinsic motivation only typically shares significant relationships with safety compliance (e.g., Jiang & Tetrick, 2016; Lim, Fang, & Wu, 2018). For instance, Scott, Fleming, and Kelloway (2014) also found intrinsic safety motivation to be a significant predictor of both safety compliance and safety participation behavior. However, they did not find any types of extrinsic motivation to be significant with safety participation, though some types of extrinsic motivation (introjected safety motivation; performing safe work to avoid shame or guilt) were unique predictors of safety compliance. It has been suggested this occurs because task-related performance is considered to be more externally regulated than contextual performance or citizenship behavior, which is more internally regulated (e.g., Legault, 2016; Conchie, 2016). Even though relationships have been documented between extrinsic motivation and safety compliance, these relationships are still weaker than those between intrinsic motivation and safety compliance (e.g., Jiang & Tetrick, 2016).

Though there has yet to be research on the topics of intrinsic and extrinsically motivated valence and instrumentality on varying types of job performance, particularly in regard to safety performance, Russo (2017) examined intrinsic and extrinsic valence and instrumentality on intentions to presentee, which are intentions for employees to perform when they are feeling sick. Russo (2017) found intrinsic-valence and intrinsic-instrumentality to predict employees' intentions to presentee, whereas extrinsic-valence and extrinsic-instrumentality did not predict employees' intentions to presentee. Although intentions to presentee are not direct measures of job performance or safety performance, the patterns of these results provide support in the direction I would expect in the safety performance context such that intrinsic-valence and intrinsic-instrumentality are more predictive. Thus, in the present study, I expect intrinsic-valence and intrinsic-instrumentality to have different effects on safety performance than extrinsic-valence and extrinsic-instrumentality. Please see Figure 5 for a visual illustration of these relationships within Model 5. This leads to the following research questions:

Research Question 1: There will be a positive relationship between intrinsic valence of safety outcomes and (RQ1a) safety compliance, (RQ1b) safety participation, (RQ1c) and safety initiative. The relationships between intrinsic valence of safety outcomes and the two types of citizenship performance (safety participation and safety initiative) will be stronger than the relationship between intrinsic valence and safety compliance (task-related performance) (RQ1d).

Research Question 2: There will be a positive relationship between extrinsic valence of safety outcomes and safety compliance.

Research Question 3: There will be a positive relationship between intrinsic instrumentality of safety outcomes and (RQ3a) safety compliance, (RQ3b) safety participation, (RQ3c) and safety initiative. The relationships between intrinsic instrumentality of safety outcomes and the two

types of citizenship performance (safety participation and safety initiative) will be stronger than the relationship between intrinsic instrumentality and safety compliance (task-related performance) (RQ3d).

Research Question 4: There will be a positive relationship between extrinsic instrumentality of safety outcomes and safety compliance.

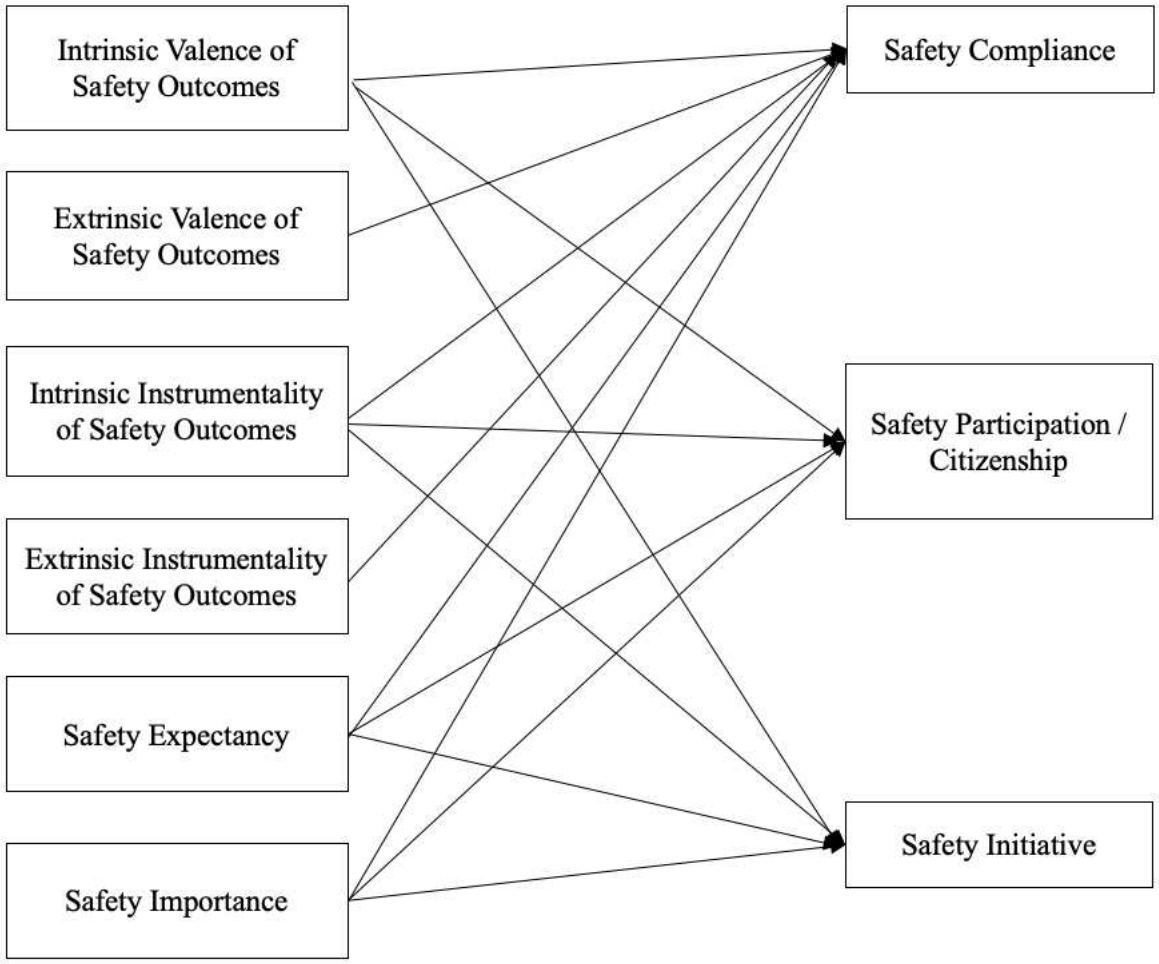

Figure 5. Model 5: Relationships between the safety motivation components and safety performance

CHAPTER 2: METHOD

Participants

MTurk Sample. Two samples were utilized for this study. The first sample was recruited using Amazon's Mechanical Turk system (MTurk, www.mturk.com). MTurk data has been shown to better reflect the general population than undergraduate samples and it meets psychometric standards of published research (e.g., Buhrmester, Kwang, & Gosling, 2011). There were several criteria for MTurk workers to participate. The participants were required to be 18 years of age or older and worked a full-time job (30 or more hours a week) in a safety-critical industry during the past 12 months. In order to determine whether or not the participants have met these criteria, they were first asked to complete a screening/qualification survey to determine eligibility. They were asked to select the industry in which they have worked (outside of MTurk) within the last 12 months. Within this list of 16 industries, 10 safety-critical industries were included that qualified the participants to complete the full survey. The list of safety-relevant industries was developed using 10 industries from the list of compiles by the Bureau of Labor Statistics (2018, data from 2017) of the industries with highest instances of fatal occupational injuries (Bureau of Labor Statistics, 2017). These industries were presented as a qualification question and can be found in Appendix A. Two additional screening questions were included that measure the extent to which the participant's job involves risks to their personal safety (the first item) and to the safety of the public (the second item). The response options ranged from *not at all* (1) to a *very large extent* (5). In order for the participant to be invited to complete the full survey, they must have responded with a 2 (*a small extent*) or higher on either of the two items. These items are also included in Appendix A. A total of 4,170 participants were

screened. Participants were compensated $0.10 for the qualification/screening survey (about $0.14 when considering MTURK fees), and $8 for the full survey ($11.20 total when including MTURK fees).

Steps were taken to ensure the sample contained a diverse range of ages in the screening survey as well. Having a wide representation of ages, particularly those in the oldest age group, is important due to the age-related nature of OFTP. The average age of the MTURK sample was 38.5, ranging from 19 years old to 70 years old. 156 participants were 45 years or older, 62 participants were 55 years or older. Although screening survey steps were utilized, 69 participants in the full survey indicated they worked in industries outside of the list of 10 provided in Appendix A. The data for these participants was retained because they indicated their job had some extent of risk to their personal safety or the safety of the public. The majority of the sample was male (56.3%), white (78.1%), in a non-supervisory or non-management role (44.5%), had earned a 4-year college degree (34.7%) and had experienced an injury on the job (54.9%). When it comes to their job involving risks, 35.8% indicated their job involves a large or a very large risk to their personal safety and 23.1% indicated their job has a large or very large risk to the public safety. In the MTURK sample, the average amount of incidents experienced on the job in the last 12 months was 1.8 (SD = 2.8) and the average number of incidents reported on the job within the last 12 months was 2.2 (SD = 2.9). The final MTURK N was 567 (data cleaning details described in the data cleaning section below). Please see Tables 4 – 8 for additional demographic information describing the samples.

Convenience Sample of Working Adults. The second sample recruited was a convenience sample of working adults. Participants were required to be 18 years or older and work more than 30 hours a week on average. Recruitment efforts were directed towards those

working within safety-critical industries (see Appendix A) with a particular emphasis on workers in construction, health care, and social services. Each participant was compensated with a $10 Amazon.com gift card. Similar to the MTURK sample, some (n=9) participants in the convenience sample indicated they worked in industries not included in the list of 10 provided in Appendix A; however, data was retained because they indicated their job has a risk to their own safety or the safety of the public. A total of 83 participants had useable data from this sample (please see the data cleaning section for additional information on omitted data). The majority of the sample was male (57.8%), white (89.2%), not in a supervisory or management position (50.6%), held a 4-year college degree (38.6%), and had experienced an injury on the job (51.8%). The majority of participants indicated their job involves a large or very large extent of risk to their personal safety (54.2%) and the public safety (55.4%). The average age of the working adult sample was 37.6, ranging from 20 years old to 65 years old. 22 participants were 45 years or older, 10 participants were 55 years or older. In this sample, the average amount of incidents experienced on the job in the last 12 months was 2.4 (*SD* = 1.8) and the average number of incidents reported on the job within the last 12 months was 1.8 (*SD* = 3.9). Please see Tables 4 - 8 for additional demographic information describing the samples.

Full Sample. In order to increase generalizability, the MTURK and convenience samples were combined for the analysis, yielding a total N of 650. The average age was 38.39 (*SD* = 11.18), 178 of the participants were 45 or older, 72 of the participants 55 or older. Similar to both of the samples in isolation, the majority of the combined full sample was male (56.5%), white (79.5%), not in a supervisory or management position (45.2%), held a 4-year college degree (35.2%), and had experienced an injury on the job (54.5%). In regard to the extent to which the participants' jobs involve risks, the most endorsed category was that there is 'some extent'

(40.3%) of risk to their personal safety and 'a small extent' (29.7%) of risk to the public safety; whereas 38.2% indicated their job involves a 'large' or a 'very large' risk to their personal safety and 27.2% indicated their job has a 'large' or 'very large' risk to the public safety. Please see Tables 4 – 8 for additional demographic information describing the samples and Table 9 for the means, standard deviations, and reliability alphas of the variables in the study for each sample.

Data Cleaning

Data cleaning procedures were the same for each sample. I utilized data cleaning procedures as described by Huang, Curran, Keeney, Poposki, and DeShon (2012), that participants can be expected to sometimes not answer honestly or be careless; therefore, it can be helpful to omit data if they do not adhere to certain guidelines (i.e., response time approach, response frequency, response invariance, and item checks.) Two attention checks (item checks) were randomly presented to the participant within the survey. MTURK participants were told that if they failed one of these, their data is unusable (thus they would not be compensated for their time). A total of 24 MTURK participants did not pass the attention check items and this data was omitted. Further, the data from 1 MTURK participant was omitted because their reported age was younger than 18, the data from 12 participants was omitted because they indicated no risk to both their own safety and the safety of the public in their job, and the data from 6 people was omitted because they did not respond to the demographic items (thus leaving uncertainty if they work in a safety-critical role).

If a participant in the working adult convenience sample failed an attention check item, they were still reimbursed, though the data was omitted from the analysis. Data was removed from 19 participants from the convenience sample because they did not pass the attention check items, and data was removed from 2 participants because they indicated their job had no risk to

themselves or to the public. Once the data was removed from each sample, there were not issues with response time approach (i.e., no participants responded in an unreasonably fast amount of time compared to the rest of the sample), response frequency (i.e., there were no participants with missing data), or response invariance (i.e., there were no remaining participants who answered with little to no variance in their responses, such as putting the same answer for every item), thus the remainder of the data was retained.

Power Analysis

A power analysis was conducted to determine the minimum number of participants needed for an adequate sample size. A simulation study was first conducted using Mplus by entering estimates based on the most complex proposed model. This step produces a determination of parameters for the proposed model (i.e., degrees of freedom). In the simulation study, the most complex model was used (model 2). This is a path model with two independent variables, five dependent variables, and a moderator on 8 of the paths (in alignment with the hypotheses). This resulted in 41 degrees of freedom. To estimate sample size calculations, quantpsy.org was used, which is an online utility to estimate power in SEM and path analysis using R software. Alpha was set to .05, desired power was set to .80, null hypothesized RMSEA was set to .05 (established value for a well-fitting model), and alternative hypothesized RMSEA was set to .1 (established value for a poor-fitting model; Steiger, 1998). Given these parameters, the required sample size for the current study is 110, and the power curve suggests there would be diminishing returns past a sample size of 200 participants. This type of power analysis determines the sample size required to detect a well-fitting model over a poor-fitting model in this circumstance of an *a priori* power analysis, when existing data is not available and

established effect sizes do not exist sufficient to run a Monte Carlo Power Simulation Study (Preacher, Cai, & MacCallum, 2007).

Design

In the present study, path analysis was utilized to test the hypotheses. All variables are scored on a continuous scale. The path analysis models tested can be found in Figures 1 – 5. Direct effects are specified in each figure. Standardized regression coefficients (i.e., β) and unstandardized coefficients are utilized. Standardized coefficients are a measure of effect size, with values of .1, .3, and .5 being considered small, medium, and large. Maximum Likelihood Estimation was used to derive parameter estimates and indices of model fit using Mplus version 8.2 (Muthén & Muthén, 1998–2018). To evaluate overall model fit, criteria by Hu and Bentler (1999) were utilized. These include the comparative fit index (CFI) > .95, Tucker–Lewis Index (TLI) > .95, root mean square error of approximation (RMSEA) < .06, and standardized root mean square residual (SRMR) < .08. The Chi-Square test of model fit was also utilized, where a non-significant test indicates perfect fit of the model to the data. When evaluating regression coefficients, I examined both standardized and unstandardized regression coefficients, standard errors, and p-values.

Assumptions testing. Prior to completing the analysis, tests were conducted to ensure violations would not be made to the underlying assumptions of the analysis. Under the assumption of multicollinearity, it is presumed there are no correlations within the independent variables that exceed .79. This was not violated as correlations were lower than this value among the independent variables in the present study (Please see Table 3 for a correlation matrix). Further, because there was no nesting in the sampling, independence of observations was not violated.

The assumption of linearity was tested by examining outliers within the dependent variables. Under this assumption, there were significant outliers larger than 3 standard deviations *below* the mean that might influence linearity (there were no outliers 3 standard deviations above the mean) for 6 out of the 8 dependent variables used in the present study (i.e., intrinsic valence of safety outcomes, extrinsic valence of safety outcomes, intrinsic instrumentality of safety outcomes, extrinsic instrumentality of safety outcomes, safety self-efficacy, and safety compliance). For each variable there were between 4 and 15 values that would be considered outliers. Although these variables were skewed left, the values that would qualify as outliers *statistically* (3 SD below the mean) were in *practical* terms not unrealistic data. For instance, 3 standard deviations below the mean for extrinsic valence of safety outcomes is 3.06 and for intrinsic valence the value is 2.7, both of which are closest to the "Slightly Disagree" response on the 7-point Likert Scale. Due to the nature of these motivational variables, it is possible for someone to have very low or very high types of safety motivation (such as valence or instrumentality), thus outliers were retained. In order to account for the non-normality of these variables, censoring (censored from above due to left skew / ceiling effect) was utilized for these 6 variables within the MPlus code (Muthén & Muthén, 2018). Finally, because several variables shared correlational relationships, modindices were used in Mplus to determine when independent variables and dependent variables should be allowed to covary in each model (using 'with' statements). Where variables were allowed to covary, this was indicated by a dotted line in models 6 – 10 in the results section.

Measures

Occupational Future Time Perspective

Occupational future time perspective was measured using the items by Zacher and Frese (2009). These items originated from the general future time perspective scale developed by Carstensen and Lang (1996) and were adapted for use in the work context. Participants rate on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) the degree to which they agree with three remaining time items (i.e., "Most of my occupational life lies ahead of me", "My occupational future seems infinite to me", and "As I get older, I begin to experience time in my occupational future as limited" [reverse coded]) and three perceived opportunities items (i.e., "Many opportunities await me in my occupational future", "I expect that I will set many new goals in my occupational future", and "My occupational future is filled with possibilities"). Authors have factor analyzed these items and found strongest support for a two-factor model (e.g., Froehlich et al., 2016; Kochoian et al., 2017; Zacher & Frese, 2009). These items can be found in Appendix B. The means, standard deviations, and reliability alphas for each scale can be found in Table 9.

Valence of Safety Outcomes

Safety valence or valence of safety outcomes describes how the individual feels in regard to the desirability of the *outcomes* associated with the action of working safely. The desirability or valence was measured for both intrinsic outcomes (e.g., internal rewards or consequences) and extrinsic outcomes (e.g., external rewards or to avoid punishment) that result from working safely. This is different from the *importance* construct as mostly utilized in the safety motivation literature which measures how important the participant feels it is to work safely. The measure of importance was included in the present study, though as a separate motivational facet called

"importance" because it has been demonstrated that importance and valence are distinct motivational constructs (e.g., Parker & Dryer, 1976).

To measure valence of safety outcomes, participants were asked to rate the desirability of 5 intrinsic and 5 extrinsic safety outcomes. They were prompted with, "There are many reasons why one might perform their job safely. Please indicate how desirable you find the following reasons for working safely…" and responded using a 7-point scale (1 = very undesirable, 2 = undesirable, 3 = somewhat undesirable, 4 = neutral, 5 = somewhat desirable, 6 = desirable, 7 = very desirable). The intrinsic and extrinsic outcomes were developed by Scott (2016) and can be found in Appendix B. The items were re-phrased to better respond to the prompt. For instance, "In order to get approval from others' (e.g., supervisor, colleagues, family, clients...)" was rephrased to "Getting approval from others (e.g., supervisor, colleagues, family, clients)".

Instrumentality of Safety Outcomes

Safety instrumentality (or instrumentality of safety outcomes) describes the extent to which a person believes working safely will result in desired outcomes. In the present study, the measurement of instrumentality also included an intrinsic and extrinsic component; participants were asked how likely it is for their safety-related behaviors to result in intrinsic or extrinsic outcomes. In order to measure safety instrumentality, participants were presented with the same outcomes from safety valence with a different item prompt. Rather than asking about the desirability of these outcomes (as in safety valence), for instrumentality the participants were presented with the following instructions: "When I perform my job safely, this will definitely result in my…" (prompt modelled after Chiang & Cheng, 2008; Maloney & McFillen, 1986; Parker & Dryer, 1976; and other similar instrumentality measurement approaches). Participants

were prompted with a Likert response scale ranging from 1 (strongly disagree) to 7 (strongly agree). These items can also be found in Appendix B.

Safety Expectancy

Safety expectancy describes an individual's beliefs in their ability to enact safety behaviors or to work safely. Participants responded to the prompt "If I work hard, I am capable of…" while considering each of the 13 safety performance items, outlined in the sections below (three safety compliance items, six safety participation items, four safety initiative items). They responded using a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). A similar approach has been utilized in past research measuring expectancy (e.g., Chiang & Jang, 2008) and also closely reflects safety-self efficacy measurement approaches (e.g., Curcuruto et al., 2019; Nykänen et al., 2019). These items can also be found in Appendix B.

Safety Importance

Safety importance was also measured using the three items by Neal and Griffin (2006) which are a revised version of the items by Neal, Griffin, and Hart (2000). These items included "I feel that it is worthwhile to put in effort to maintain or improve my personal safety", "I feel that it is important to maintain safety at all times", and "I believe that it is important to reduce the risk of accidents and incidents in the workplace". Employees were asked to rate how much they agree with the items on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). These items can also be found in Appendix B.

Safety Compliance

Safety compliance was measured using three items developed by Neal and Griffin (2006). These three items included "I use all the necessary safety equipment to do my job", "I use the correct safety procedures for carrying out my job", and "I ensure the highest levels of

safety when I carry out my job". Employees were asked the extent to which they engaged in these behaviors in the last 4 months using a 7-point response scale ranging from 1 (never) to 7 (always; *i.e., never, almost never, occasionally, frequently, usually, almost always, always*). These items can also be found in Appendix B.

Safety Participation

Safety participation was measured using six items developed by Hofmann, Morgeson, and Gerras (2003). The six items included: "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". Employees were asked the extent they engaged in these behaviors in the last 4 months using a 7-point response scale ranging from 1 (never) to 7 (always; *i.e., never, almost never, occasionally, frequently, usually, almost always, always*). These items can also be found in Appendix B.

Safety Initiative

Safety initiative was measured using the four-item scale developed by Curcuruto et al. (2019) based on Hoffman et al.'s (2003) measure of initiating safety-related change. The four items included: "Trying to change the way the job is done to make it safer", "Trying to change policies and procedures to make them safer", "Trying to improve safety procedures", and "Making suggestions to improve the safety of a work activity". Employees were asked the extent they engaged in these behaviors in the last 4 months using a 7-point response scale ranging from 1 (never) to 7 (always; *i.e., never, almost never, occasionally, frequently, usually, almost always, always*). These items can also be found in Appendix B.

Safety Climate

Safety climate was measured using the 16-item group-level safety climate scale developed by Zohar and Luria (2005). Participants were promoted with, "My direct supervisor…" and rate their agreement with items such as "Spends time helping us learn to see problems *before* they arise" and "Insists we wear our protective equipment even if it is uncomfortable" on a scale from 1 (strongly disagree) to 7 (strongly agree). These items can be found in Appendix B.

CHAPTER 3: RESULTS

Descriptive Statistics

Prior to presenting the model results, I will discuss general findings and trends in the descriptive statistics in order to provide a more detailed and concrete understanding of the data (Murphy, in press). In the present study, a number of new empirical relationships are examined in addition to testing the replications of previously investigated relationships. To ensure the current sample responded consistently with samples from previous published research, correlation coefficients and means will be compared to past research where applicable. Further, a review of simple descriptive statistics prior to analysis is helpful in understanding more complex conclusions from the data.

Occupational Future Time Perspective. In the present study, PO-OFTP and RT-OFTP are examined as predictors of facets of safety motivation or safety performance. In past research, the correlation between the two types of OFTP ranges from about .58 to .72 (e.g., Froehlich et al., 2016; Weikamp & Göritz, 2015; Zacher & Frese, 2009). In the meta analysis conducted by Rudolph et al. (2018), the sample size-weighted and reliability-corrected meta-analytic correlation was .72. In the present study, the correlation between the two dimensions of OFTP equaled .63, thus consistent with past research. Further, according to the meta analysis, the average correlation between OFTP and age is -0.55. In the present study the correlation between age and OFTP is -0.58.

OFTP and Safety Motivation. It is hypothesized in the present study that PO-OFTP will be negatively related to intrinsic valence of safety outcomes and positively related to the remaining facets of safety motivation. Although these hypotheses will be confirmed using path

analysis, the correlation matrix can be referenced in Table 3 to glean preliminary patterns in the data. According to the matrix, PO-OFTP is positively and significantly correlated with all of the motivational facets. This could potentially be support for all hypotheses (with the exception of H1a, which predicts a negative relationship). In the same model, RT-OFTP is expected to be negatively related to intrinsic valence of safety outcomes and positively related to the remaining motivational facets. Again, according to the matrix, RT-OFTP shares a positive (significant, weak) relationship with the motivational facets. This could potentially provide support for the hypotheses, with the exception of the relationship between RT-OFTP and intrinsic valence of safety outcomes, because this was the opposite direction than expected. Further investigation will be needed.

OFTP and Safety Climate. In the present study it is suggested there will be a moderator effect between the OFTP types and safety climate. Because the likelihood of detecting a moderator decreases as the correlation between the moderator and independent variables increases, I examined these correlation coefficients ahead of time to preliminarily assess the data (Murphy, in press; Murphy & Russell, 2017). In the current study, the correlations between safety climate and PO-OFTP (r = .27) and RT-OFTP (r = .16) are small to moderate, thus there is some potential for the cross-product terms to unique information (detect a moderator effect).

Safety Motivation and Safety Performance. In the present study, six motivational facets are examined as predictors of the different types of safety performance. In past literature, some of these relationships have been tested (between safety importance and two of the three types of safety performance (i.e., safety compliance and participation). In previous research, the correlation between safety importance motivation and safety compliance was between about .55 and .75 (Neal, Griffin, & Hart, 2000; Zacharatos, Barling, & Iverson, 2005). The correlation

between safety importance and safety participation at about .53, and the correlation between safety importance motivation and safety initiative at about .38 (Neal, Griffin, & Hart, 2000; Zacharatos, Barling, & Iverson, 2005). In the present study, the correlation between safety importance motivation and safety compliance, safety participation, and safety initiative were r = .53, r = .16, and r = .08, respectively. These correlations are smaller than relationships in previous research; however, a similar pattern exists such that the strongest correlation is between safety importance motivation and compliance, followed by participation and then initiative. Also similar to past research, safety participation and safety initiative were highly correlated in the present study (r = .78), thus were allowed to covary in Models 3-5 (a "WITH statement" was added in Mplus for each model).

Model 1: Relationships Between OFTP and Facets of Safety Motivation

Overall model fit. The path analysis resulted in values of model fit that were in the acceptable range. The Chi-Square test of model fit was significant ($\chi_2(2) = 11.08$, p = .004). Overall fit indices were decent (RMSEA = .08 [.04, .13], p = .09; CFI = 0.99; TLI = 0.92; SRMR = .013).

Direct effects on valence. As predicted in Hypothesis 1, PO-OFTP was significantly related to both intrinsic valence of safety outcomes (H1a; b = .23, SE = .03, p < .001) and extrinsic valence of safety outcomes (H1b; b = 0.12, SE = .03, p < .001). Both Hypothesis 1a and 1b had moderate effects (β = .30, β = .19 respectively). Thus, higher perceived future opportunities at work was associated with higher desirability (valence) of intrinsic and extrinsic outcomes associated with working safely.

Direct effects on instrumentality It was hypothesized that RT-OFTP would be positively related to both intrinsic valence of safety outcomes (H2a) and extrinsic valence of

safety outcomes (H2b). Both Hypotheses 2a and 2b were not supported. Hypothesis 2a was significant in the opposite direction than predicted; RT-OFTP was negatively related to intrinsic valence (b = -0.07, SE = .04, p = .02) and the effect was very small (β = -0.09). Hypothesis 2b was non-significant, thus one's perceived remaining time at work was not related to their perceived desirability of extrinsic safety outcomes.

It was hypothesized that PO-OFTP would be positively related to both intrinsic instrumentality of safety outcomes (H3a) and extrinsic instrumentality of safety outcomes (H3b). Both hypotheses were supported such that PO-OFTP was significantly related to intrinsic instrumentality (b = .19, SE = .03, p < .001) and extrinsic instrumentality (b = .21, SE = .03, p < .001). Both Hypothesis 3a and 3b showed small to moderate effects (β = .24, β = .28, respectively). Thus, higher perceived future opportunities at work was associated with higher beliefs they can receive both intrinsic and extrinsic outcomes when they work safely.

Direct effects on expectancy. Hypothesis 4 was supported, such that PO-OFTP was positively related to safety expectancy (b = .28, SE = .03, p < .001; β = .42). Higher perceived future opportunities increased at work was associated with higher perceived capability in performing the job safely. Hypothesis 5 was not supported, because RT-OFTP was significantly related to safety expectancy in the opposite direction than predicted (b = -0.08, SE = .03, p = .005). This effect was small (β = -0.11). Thus, higher perceived remaining time was associated with lower feelings of capably doing the job safety if they work hard at it. Please see Figure 6 for all beta values for Model 1 and see Table 10 for a summary of all hypothesis and research question results.

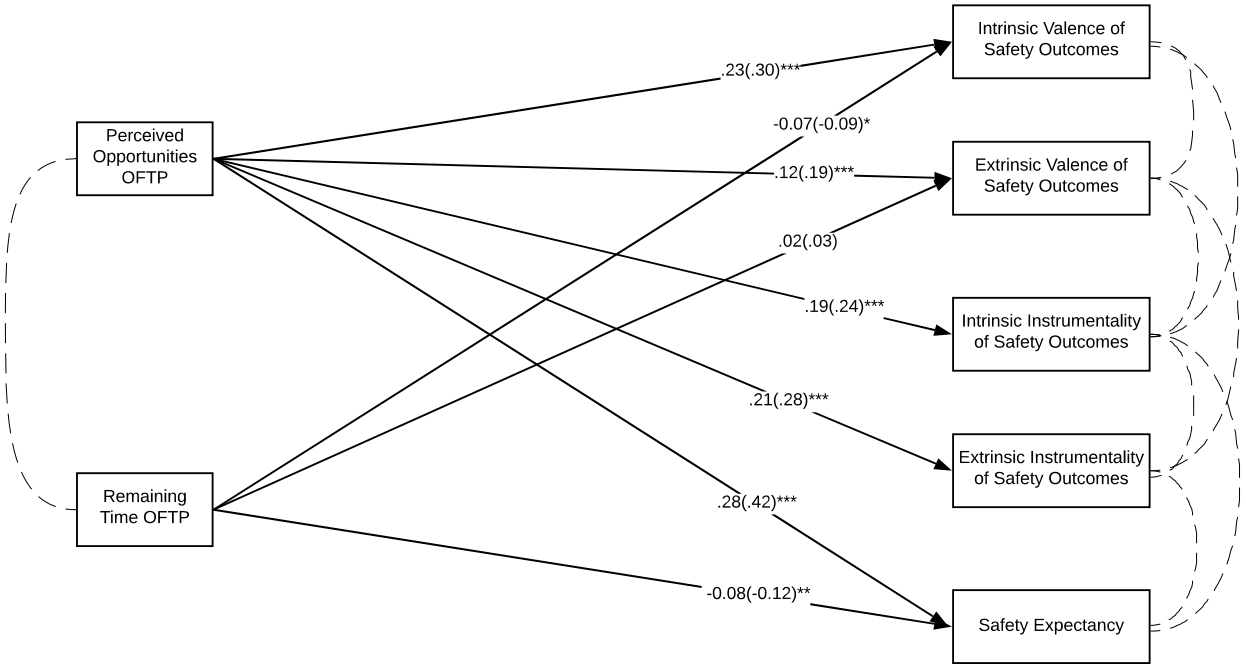

Figure 6. Model 1 Results. Unstandardized beta outside of the parentheses, standardized beta inside of the parenthesis [*b*(β)]; *p* = < .05*, *p* = < .01**, *p* = < .001***

Model 2: Safety Climate as a Potential Moderator of OFTP on Safety Motivation

Overall model fit. The path analysis resulted in values of model fit that were in the acceptable range. The Chi-Square test of model fit was significant ($\chi_2(10) = 86.7$, $p < .001$). Overall fit indices were decent (RMSEA = .10 [.09, .13], *p* < .001; CFI = 0.95; TLI = 0.80; SRMR = .06).

Direct effects. The direct paths in Model 2 were similar to Model 1. PO-OFTP was significantly and positively related to each motivational facet. RT-OFTP was negatively related to both intrinsic valence of safety outcomes and safety expectancy, and was not related to extrinsic valence of safety outcomes. Please see Figure 7 for all beta values in Model 2 and Table 10 for a summary of all hypothesis and research question results.

Moderation effects. The interactions involving safety climate and PO-OFTP or RT-OFTP were non-significant; Hypotheses 6 and 7 were not supported. Although the interaction

between safety climate and OFTP did not reach significance, when examining the plots describing the relationship between OFTP and safety climate (Supplemental Figures 1-8), a similar pattern emerged. In almost all circumstances, there is a slight positive relationship between the motivational facet and PO-OFTP or RT-OFTP. Further, those working in the most positive safety climates had the highest levels of reported safety motivation, followed by those in the middle and those in the more negative safety climates, respectively.

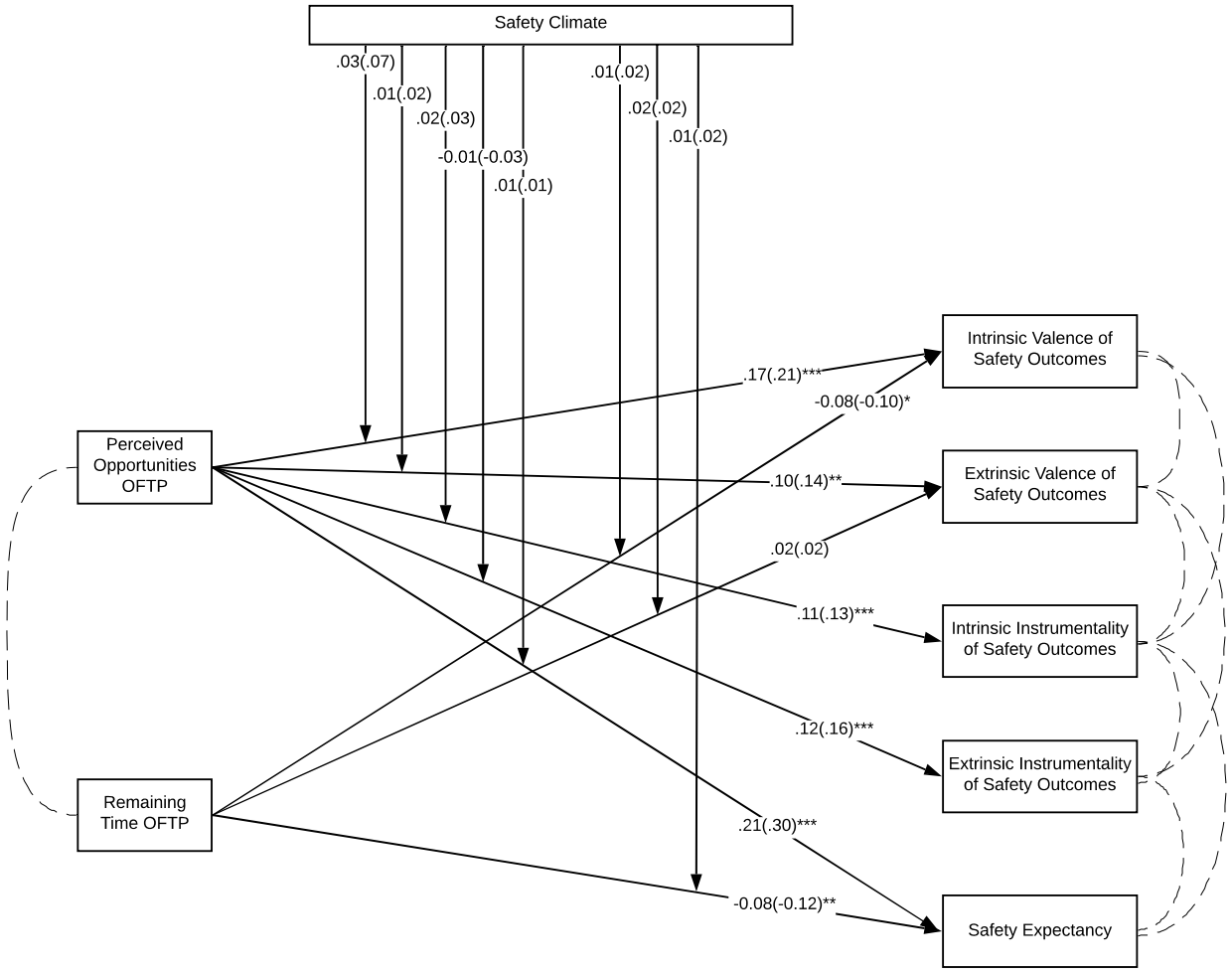

Figure 7. Model 2 Results. Unstandardized beta outside of the parentheses, standardized beta inside of the parenthesis [*b*(β)]; *p* = < .05*, *p* = < .01**, *p* = < .001***

Model 3: Relationships between Safety Motivation and Safety Performance

Overall model fit. The path analysis resulted in values of model fit that were in the acceptable range. The Chi-Square test of model fit was non-significant ($\chi^2(1) = 0.001$, $p = .97$). Overall fit indices were excellent (RMSEA = .00 [.00, .00], $p = .98$; CFI = 1.00; TLI = 1.00; SRMR = .00).

Valence direct effects. Although it was hypothesized there would be a positive relationship between valence of safety outcomes and safety compliance (H8a), safety participation (H8b), and safety initiative (H8c), none of these hypotheses were supported. The relationship between valence of safety outcomes and safety compliance was significant in the opposite direction (H8a; $b = -0.26$, $SE = .07$, $p < .001$; the effect was small, $\beta = -0.16$), and the relationships between valence of safety outcomes and safety participation and safety initiative were non-significant (H8b and H8c).

Instrumentality direct effects. All parts of Hypothesis 9 were supported such that instrumentality was significantly related to safety compliance (H9a; $b = .41$, $SE = .06$, $p < .001$, the effect was medium, $\beta = .28$), safety participation (H9b; $b = .48$, $SE = .07$, $p < .001$, the effect was medium, $\beta = .28$) and safety initiative (H9c; $b = .60$, $SE = .08$, $p < .001$, the effect was medium, $\beta = .31$). Thus, higher feelings of safety instrumentality were associated with greater compliance, participation, and initiative.

Expectancy direct effects. All parts of hypothesis 10 were supported such that expectancy was significantly related to safety compliance (H10a; $b = .40$, $SE = .07$, $p < .001$, the effect was medium, $\beta = .26$), safety participation (H10b; $b = .94$, $SE = .07$, $p < .001$, the effect was large, $\beta = .50$) and safety initiative (H10c; $b = 1.0$, $SE = .10$, $p < .001$, the effect was large, $\beta = .50$). It was also hypothesized that the strongest relationships would be between expectancy

and safety participation and initiative (the two types of citizenship performance). With smaller relationships between expectancy and safety compliance (task-related performance; H10d). This hypothesis was tested using model constraints in path analysis, and it was found that there is a significant difference between both paths involving citizenship-type performance and the path between safety expectancy and compliance. In order words, the relationships between safety expectancy and safety participation (b = .53, SE = .09, p < .001) and safety initiative (b = .60, SE = .10, p < .001) are significantly stronger than the path between safety expectancy and safety compliance.

Safety importance direct effects. It was hypothesized there would be a positive relationship between safety importance and safety compliance (H11a), safety participation (H11b), and safety initiative (H11c). Hypothesis 11a was supported (b = .54, SE = .07, p < .001, the effect was moderate, β = .31). Hypotheses 11b (b = -0.42, SE = .09, p < .001, the effect was small to moderate, β = -0.21) and 11c (b = -0.64, SE = .10, p < .001, the effect was moderate, β = -0.29) were not supported because the relationships were significant in the opposite direction than expected. Model constraints were not needed to test the relationships in Hypothesis 11d. It was hypothesized that the positive relationship between safety importance and compliance would be stronger than the positive relationships between safety importance and the two type of citizenship behavior (safety participation and safety initiative). Because these latter two relationships were negative, by default the strongest positive relationship was between safety importance and safety compliance. Please see Figure 8 for all beta values in Model 3 and Table 10 for a summary of all hypothesis and research question results.

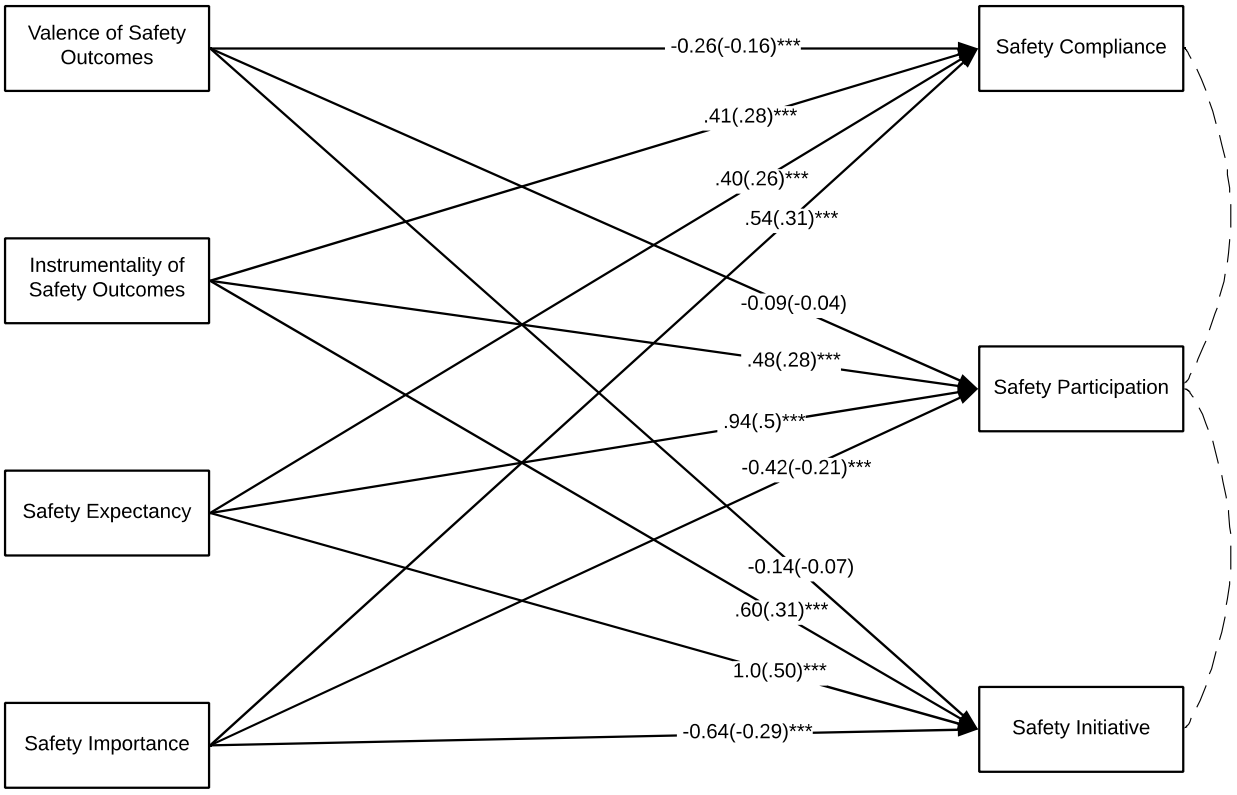

Figure 8. Model 3 Results. Unstandardized beta outside of the parentheses, standardized beta inside of the parenthesis [*b*(β)]; *p* = < .05*, *p* = < .01**, *p* = < .001***

Model 4: Relationships between OFTP and Safety Performance

Overall model fit. The path analysis resulted in values of model fit that were in the acceptable range. The Chi-Square test of model fit was non-significant ($\chi^2(1) = .3$, p = .584). Overall fit indices were excellent (RMSEA = .00 [.00, .09], p = .80; CFI = 1.00; TLI = 1.00; SRMR = .004).

Direct effects on safety compliance. Hypothesis 12 was supported such that there was a positive relationship between Perceived Opportunities OFTP (PO-OFTP) and safety compliance (*b* = .17, *SE* = .04, *p* < .001) and the effect was small (β = .17).

Direct effects on safety participation. Hypothesis 13a was supported, such that the relationship between PO-OFTP and safety participation was positive and significant (*b* = .38, *SE*

= .07, $p < .001$) and the effect was moderate (β = .33); however, the relationship between RT-OFTP and safety participation was not significant, thus Hypothesis 13b was not supported. Because Hypothesis 13b was non-significant, Hypothesis 13c is supported such that the relationship in H13a is stronger than the relationship in H13b.

Direct effects on safety initiative. Finally, it was hypothesized that both (H14a) PO-OFTP and (H14b) RT-OFTP would be related to safety initiative, though (H14c) RT-OFTP would have a stronger relationship with safety initiative than PO-OFTP. Hypothesis 14a was supported (b = .33, SE = .06, $p < .001$; (β = .25); however, Hypotheses 14b and 14c were not supported because there was not a significant relationship between RT-OFTP and safety initiative. Please see Figure 9 for all beta values in Model 4 and Table 10 for a summary of all hypothesis and research question results.

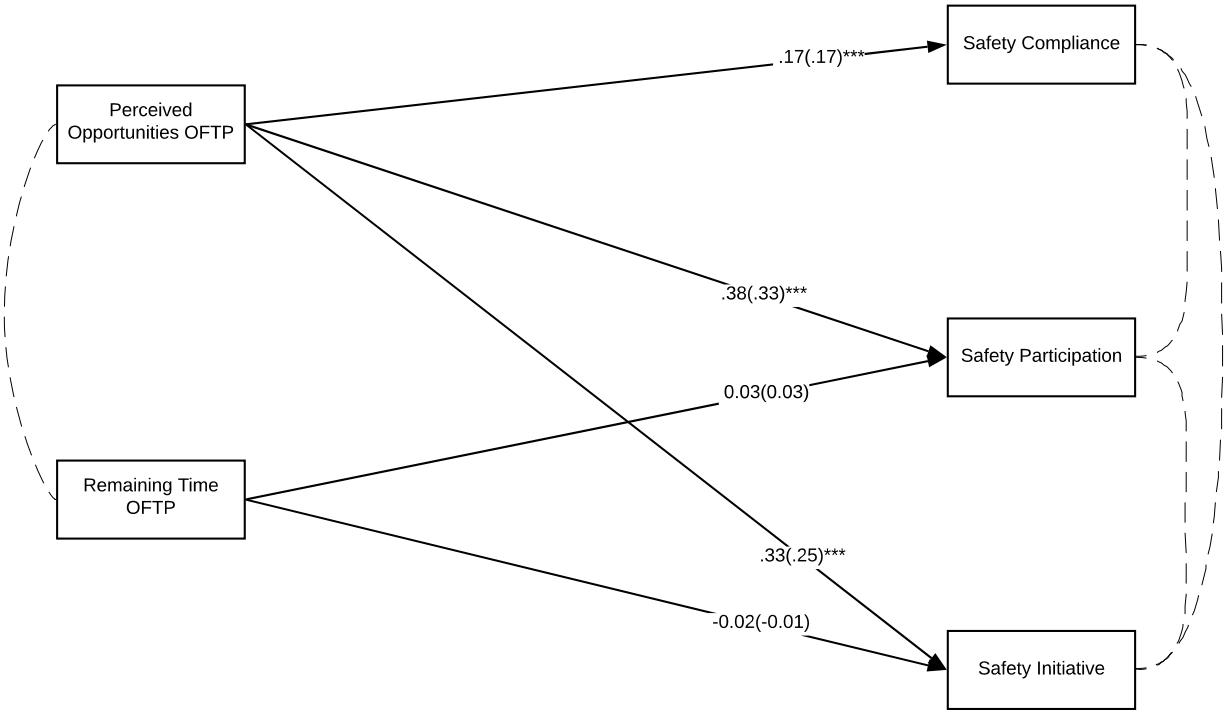

Figure 9. Model 4 Results. Unstandardized beta outside of the parentheses, standardized beta inside of the parenthesis [b(β)]; p = < .05*, p = < .01**, p = < .001***

Model 5: Research Question Relationships between Safety Motivation and Safety Performance

Overall model fit. The path analysis resulted in poor to moderate overall model fit for Model 5. The Chi-Square test of model fit was significant ($\chi_2(5) = 48.14$, $p < .001$). Overall fit indices were poor to moderate (RMSEA = .11 [.09, .15], $p < .001$; CFI = 0.92; TLI = 0.65; SRMR = .12).

Intrinsic valence direct effects. Model 5 involved research questions rather than hypotheses. Model 5 is similar to Model 3 such that facets of safety motivation are examined with safety performance, though the intrinsic and extrinsic components of both valence and instrumentality were modeled separately in Model 5 (thus there were 6 predictors rather than 4). The first research question suggested there will be a positive relationship between intrinsic valence of safety outcomes and (RQ1a) safety compliance, (RQ1b) safety participation, (RQ1c) and safety initiative. The first research question was not supported (RQ1a), though the latter two research questions were supported (RQ1b-1c). There was not a significant relationship between intrinsic valence of safety outcomes and safety compliance. However, there was a positive, significant relationship between intrinsic valence and safety participation ($b = .22$, $SE = .07$, $p = .002$) and safety initiative ($b = .25$, $SE = .08$, $p = .002$). The effects were small for each path ($\beta = .14$). Research question 1d suggested the relationship between intrinsic valence of safety outcomes and the two type of citizenship behavior would be stronger than the relationship between intrinsic valence and safety compliance. This research question was supported because there was not a significant relationship between intrinsic valence of safety outcomes and safety compliance.

Extrinsic valence direct effects. Research question 2 suggested there will be a positive relationship between extrinsic valence of safety outcomes safety compliance. Although this path was significant, the research question was not supported because the relationship was in the opposite direction than expected (b = -0.19, SE = .06, p = .002; the effect was small, β = -0.13).

Intrinsic instrumentality direct effects. The third research question suggested there will be a positive relationship between intrinsic instrumentality of safety outcomes and (RQ3a) safety compliance, (RQ3b) safety participation, (RQ3c) and safety initiative. The first research question (RQ3a) was not supported, though the latter two research questions were supported. There was not a significant relationship between intrinsic instrumentality of safety outcomes and safety compliance. However, there was a positive, significant relationship between intrinsic instrumentality and safety participation (b = .15, SE = .07, p = .002) and safety initiative (b = .31, SE = .07, p < .001). The effects were small for each path (β = .11 and .19, respectively). Research question 3d suggested the relationship between intrinsic instrumentality of safety outcomes and the two type of citizenship behavior would be stronger than the relationship between intrinsic instrumentality and safety compliance. This research question was supported because there was not a significant relationship between intrinsic instrumentality of safety outcomes and safety compliance.

Extrinsic instrumentality direct effects. Finally, research question 4 stated there will be a positive relationship between extrinsic instrumentality safety compliance. This was supported such that higher perceived extrinsic instrumentality of safety outcomes is associated with increased safety compliance (b = .27, SE = .06, p < .001) and the effect was small to medium (β = .20).

Expectancy and importance direct effects. The two other predictors in the model, safety expectancy and safety importance, performed similarly to the results from Model 3. Safety expectancy was positively and significantly related to all three types of safety performance. Safety importance was positively and significantly related to safety compliance, though it was negatively and significantly related to both safety participation and safety initiative. Please see Figure 10 for all beta values in Model 5 and Table 10 for a summary of all hypothesis and research question results.

Model constraints. When comparing all of the motivational facets in Model 5, safety importance and safety expectancy were the strongest predictors of safety compliance, safety expectancy was the strongest predictor of safety participation and safety initiative. The top three predictors of safety compliance according to the beta values were safety importance, safety expectancy, and extrinsic instrumentality of safety outcomes. Model constraints determined safety importance was not a significantly better predictor than safety expectancy, though it was a significantly better predictor than extrinsic instrumentality of safety outcomes. In order words, the relationship between safety importance and safety compliance is not significantly different than the relationship between safety expectancy and safety compliance (b = .14, SE = .11, p = .2); however, the relationship between safety importance and safety compliance is significantly different than the relationship between extrinsic instrumentality of safety outcomes and safety compliance (b = .28, SE = .09, p = .002).

The top two predictors of safety participation were safety expectancy and safety importance; model constraints revealed safety expectancy was a significantly stronger predictor than safety importance (b = 1.31, SE = .13, p < .001). The top two predictors of safety initiative were also safety expectancy and safety importance. Similarly, model constraints revealed safety

expectancy was a significantly stronger predictor of safety initiative than safety importance (b = 1.57, SE = .16, p < .001).

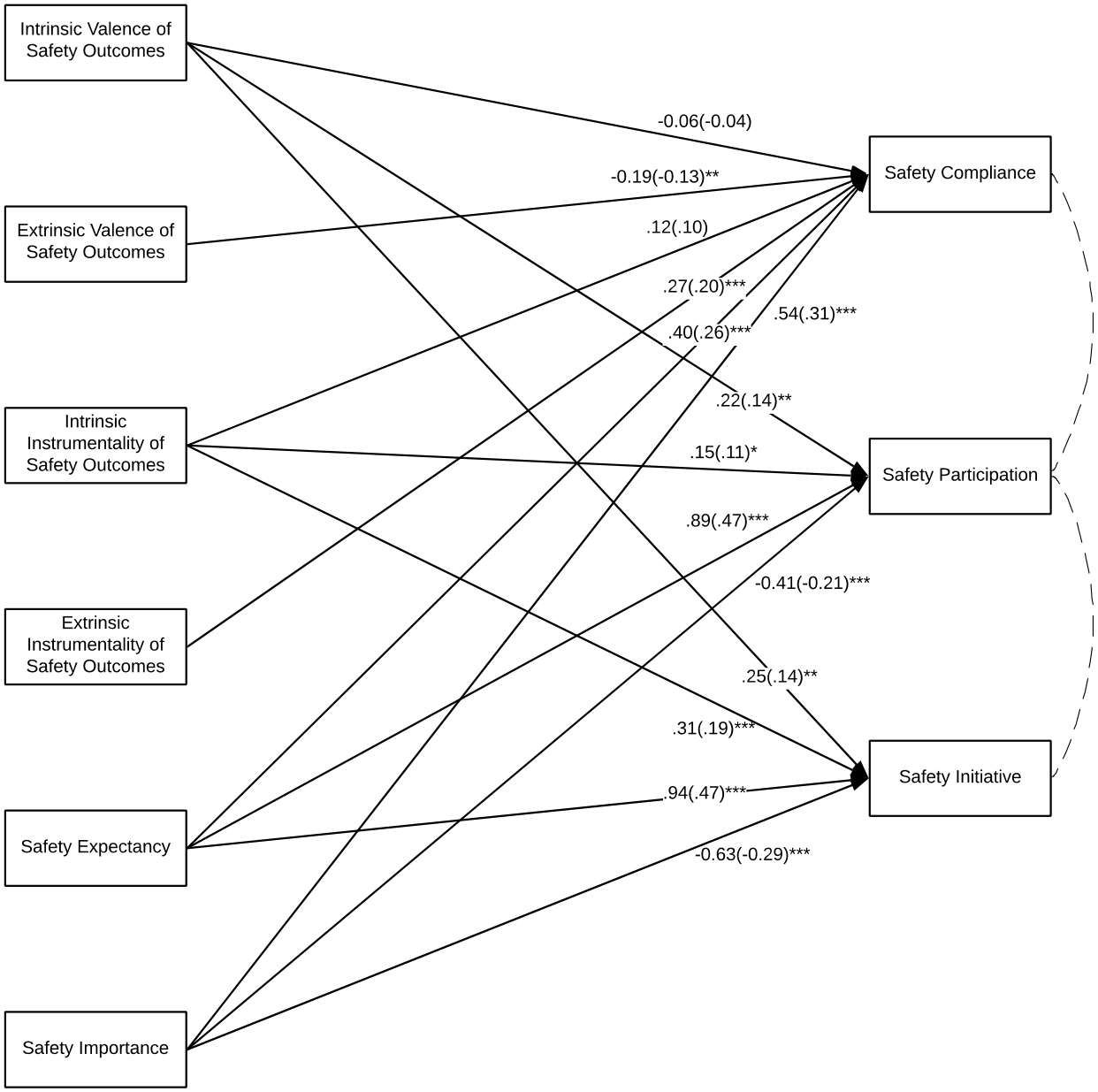

Figure 10. Model 5 Results. Unstandardized beta outside of the parentheses, standardized beta inside of the parenthesis [b(β)]; p = < .05*, p = < .01**, p = < .001***

CHAPTER 4: DISCUSSION

Researchers have called for additional research on safety motivation in order to more fully develop theory related to safety and to provide practical recommendations (e.g., Beus & Taylor, 2018; Curcuruto et al., 2019). In addition, there has been a growing interest among aging researchers to better understand lifespan constructs, such as OFTP, as they relate to occupational safety (Crawford, 2016). The present study makes several contributions to the literature on safety motivation, safety performance, and the literature on aging at work, specifically on occupational future time perspective.

Contributions to safety motivation theory. The first goal of this study was to more thoroughly examine safety motivation, through the theoretical lens of expectancy theory, specifically by utilizing different components of safety motivation. Safety motivation is typically measured in the literature as a safety importance construct (Neal & Griffin, 2006). Building upon theoretical propositions by Beus and Taylor (2018), a portion of this study empirically tested expectancy theory within a safety framework. Beus and Taylor (2018) proposed that an individual's engagement in safety-related behavior can be explained by expectancy theory. Findings from the present research confirm the safety motivation facets consistent with expectancy theory predict safety performance distinct from and in addition to the preexisting safety importance motivation facet. When all motivational facets were included in the same model (Model 5) to examine the effects on three different types of safety performance, safety importance and safety expectancy performed significantly similar when it comes to predicting safety compliance. Safety expectancy was the strongest predictor of both safety participation and safety initiative, followed by safety importance.

The two types of valance (intrinsic and extrinsic valence of safety outcomes) and the two types of instrumentality (intrinsic and extrinsic instrumentality) also contributed meaningful variance when predicting safety performance. These findings highlight the value of using expectancy theory within the safety to more fully understand safety motivation in predicting varying types of safety performance (because variance can be explained by motivational facets other than safety importance motivation). Therefore, contributing to safety motivation theory, the present research results indicate that safety expectancy and valence are unique and valuable predictors of safety behavior in addition to safety importance.

Contributions to the content domains of safety motivation and safety performance. A second goal of the study was to examine the relationships between safety motivation (including expectancy theory components) on an expanded articulation of the safety performance construct. Until recently, researchers conceptualized safety performance primarily using two behaviors (safety compliance and safety participation; e.g., Christian et al., 2009; Neal & Griffin, 2000). Recently, scholars have recognized a third performance component called safety initiative (Curcuruto et al., 2018). The present study investigated the empirical relationships among different motivational facets on the updated, three-dimensional understanding of safety behavior. Two models were used to examine these relationships. Model 3 (H8a – H11d) had four motivational facets as the predictor variables (i.e., valence, instrumentality, expectancy, and importance) whereas Model 5 (RQ1a- RQ4) had six motivational facets, because valence and instrumentality were expanded to reflect intrinsic and extrinsic components of each.

The results from Model 3 (the condensed model) demonstrated varying relationships between different motivational facets on safety performance. For instance, valence of safety outcomes was significantly and negatively related to safety compliance but was not related to

safety participation or initiative. Both instrumentality of safety outcomes and safety expectancy were positively related to all three types of safety performance. Finally, safety importance was positively related to safety compliance yet was negatively related to both safety participation and initiative. Although the former relationship between importance and compliance was expected, the negative relationship was not consistent with previous findings (i.e., a positive correlation has been found between safety importance and safety participation in the research literature; e.g., Neal, Griffin, & Hart, 2000; Zacharatos, Barling, & Iverson, 2005). One plausible explanation is that in the current study, all facets of motivation are included simultaneously in the model. Therefore, it is possible the sign of the relationship changed from positive to negative once all of the motivational facets were taken into account. However, because researchers have yet to include multiple types of safety motivation in a single model, it is possible the sign switched due to the inclusion of several motivational facets.

Another possibility is a suppressor effect (Conger, 1974), which happens when the addition of predictor variables increases the predictive power of other variables in the model. Thus, when this particular variable is added, the sign can change as well. Additional post hoc regression analyses were conducted to investigate how the relationship between safety importance and each type of citizenship safety performance changed depending on which motivational facets were included along with safety importance as predictor variables in the model. When safety importance motivation was included in a regression model in isolation, the relationship with safety participation (or safety initiative, depending on the model) was positive and significant. However, adding any motivational facet or group of facets either changed the sign of this relationship to negative or resulted in a non-significant relationship. Thus, the inclusion of other motivational facets in the same model as safety importance influences the

direction of the result. Future researchers need to confirm this phenomenon in additional samples to more fully understand this finding.

In the expanded model (Model 5), when the intrinsic and extrinsic components of *valence* were considered individually, different findings emerged than from the condensed model (Model 3). Intrinsic valence of safety outcomes was not significantly related to safety compliance, though it was significantly associated with safety participation and safety initiative. Extrinsic valence of safety outcomes was negatively associated with safety compliance. In other words, when the two types of valence are combined (as in Model 3), none of the hypotheses were significant involving valence. However, when they are considered as distinct components, intrinsic valence (though not related to compliance) was positively related to participation and initiative, whereas extrinsic valence was negatively related to compliance. Thus, when an individual perceives intrinsic outcomes as highly desirable, this is associated with higher levels of safety participation and initiative (and not compliance). Though when an employee feels extrinsic safety outcomes are highly desirable, this is associated with *less* safety compliance.

The observed significant relationship between intrinsic valence and safety citizenship behavior was hypothesized. Previous research has demonstrated that intrinsic safety motivation is related to safety behaviors such as safety voice (making constructive suggestions for change; a safety participation behavior; Conchie, 2013). However, this same study found a positive relationship between intrinsic safety motivation and whistleblowing (reporting violations) which is a safety compliance behavior, even though the relationship between a similar construct in the present study (intrinsic valence of safety outcomes) was not significantly related to safety compliance in the model. The finding between extrinsic valence of safety outcomes and lower compliance was not predicted, though previous findings are consistent with this pattern. For

instance, Jiang and Tetrick (2016) found a negative relationship between external motivation (a different yet related construct) and compliance behavior.

Further, the relationship between extrinsic valence of safety outcomes and safety compliance in the present study depends on the model. When valence and compliance are examined in isolation, there is a weak positive significant relationship. However, when included in a model with other motivational facets, the relationship becomes negative. Future research could further examine how the motivational facets interact and/or complement one another, potentially using ranking methods that force the participant to decide which motivational facets contribute the greatest and least influence on their different types of safety performance. By asking the participants which motivational facets they think are more or less motivating or influential in driving their performance, this could offer a different perspective and method on understanding the comparative effects beyond path analysis.

In the expanded model (Model 5), when intrinsic and extrinsic components of *instrumentality* were considered separately, one difference emerged. In Model 3, instrumentality was significantly related to all three types of safety performance. In Model 5, intrinsic instrumentality of safety outcomes was not significantly related to safety compliance, though it was positively related to participation and initiative. The non-significant finding between intrinsic instrumentality and safety compliance was not predicted, because previous research has confirmed positive significant relationships with similar constructs (Scott, Fleming, & Kelloway, 2014). Extrinsic instrumentality of safety outcomes was positively related to safety compliance, however. This finding was predicted because research has confirmed that extrinsic motivation only typically shares significant relationships with safety compliance, not safety participation (e.g., Jiang & Tetrick, 2016; Lim, Fang, & Wu, 2018).

The results for intrinsic instrumentality were the same as the results for intrinsic valence with the safety outcomes. Intrinsic instrumentality was not related to compliance and it was positively related to both participation and initiative. However, the relationship between extrinsic instrumentality and safety compliance was positive (unlike the relationship between extrinsic *valence* and compliance, which was negative). Thus, when an individual finds extrinsic outcomes or extrinsic rewards associated with working safety to be desirable (valence) there was a *negative* relationship with safety compliance; alternatively, when an individual feels their safe work will definitely result in extrinsic outcomes associated with working safely (instrumentality), there was a *positive* relationship with safety compliance.

For both the condensed model (Model 3) and expanded model (Model 5), safety expectancy was strongly and positively related to all three types of safety performance. Although all paths were significant for safety expectancy, the strongest relationships were between expectancy and the two citizenship types of behavior. In fact, safety expectancy was the strongest predictor for both safety participation and safety initiative when compared to all other motivational facets (confirmed using model constraints). Safety expectancy describes an individual's beliefs in their ability to enact safety behaviors or to perform safely (Vroom, 1964). Participants responded to the prompt "If I work hard, I am capable of…" while considering 13 safety performance items. When considering all the motivational facets in the model simultaneously, this means the strongest predictor of safety citizenship behavior was someone's assessment of how capable they are in preforming the safe work, not necessarily the rewards associated with it, how important they think it is, or if they can earn it in the first place.

In practical terms, this is an important point to consider. Although someone might find the outcomes associated with working safely to be desirable (valence), think they will actually

receive those outcomes if they work safely (instrumentality), and think it is important to work safely (safety importance), the strongest determinant was whether or not they actually feel capable in the first place. Future research could examine in more depth what resources (internal or external) contribute to these perceptions of expectancy. There could be a host of reasons as to why someone feels a greater or lesser extent of expectancy towards safety performance (Christian et al., 2009). It could be due to resources (poor maintenance on equipment, poor or outdated machinery, uncomfortable protective equipment), individual differences, demands in the workplace (high production pressure), or other factors (e.g., Curcuruto et al., 2018; Neal & Griffin, 1997). Future researchers could examine safety expectancy using a more comprehensive approach, such as describing the potential antecedents as they relate to safety performance more specifically. In addition, a practical approach should be used when conducting this expanded analysis of safety expectancy to also investigate intervention methods to positively influence safety expectancy. After identifying the main antecedents, changes can be made accordingly to measure potential change over time. For example, if an antecedent is shown to be inadequate balance between safety and production, leaders can work to start prioritizing safety *before* speed when it comes to work. Longitudinal methods could also be used to examine these antecedents over time, and how these impact safety motivation and performance over time.

Contributions to OFTP and safety motivation. The third goalof this study was to examine Occupational Future Time Perspective (OFTP; Zacher & Frese, 2009) on safety motivation (Model 1) and on safety performance (Model 4). By examining the differential relationships of OFTP on safety motivation, we can better understand how a person's time horizon and the amount of perceived opportunities they have at work are associated with different safety-related motivational components. The results of Model 1 illustrated there were

different relationships between PO-OFTP and RT-OFTP when it comes to the safety motivation facets. As one's perceived future work opportunities increased, this was related to an increase in all motivational facets. Perceiving more opportunities in the future was related to feeling both intrinsic and extrinsic safety outcomes were more desirable, feeling these outcomes were more attainable (instrumentality), and feeling they were more capable of performing the work safely (expectancy; Vroom, 1964).

Different findings emerged for RT-OFTP. As one's perceived remaining time increased at work, this was related to a significant decrease in finding intrinsic outcomes associated with working safely desirable, and also associated with a decrease in feeling capable of performing the work safely. The decrease in finding intrinsic outcomes desirable as perceived remaining time increased was not expected or aligned with lifespan theory (when conceptualizing RT-OFTP as an age-related variable). It is possible there are other non-age-related factors involved with RT-OFTP explaining this relationship, and additional elaboration of these findings as they relate to theory are discussed in the Theoretical Contributions section.

As one's perceived remaining time at work increased, this was related to feeling less capable of doing the job safely if they work hard at it (safety expectancy). This is contrary to what was predicted, because outside of the safety context, future time perspective shares a positive relationship with occupational self-efficacy (a distinct construct, yet theoretically similar to safety expectancy due to the individual's belief in their own ability to perform). To explain this contrary finding, it would be reasonable to assume this relationship was driven by age. For instance, because remaining time OFTP can be conceptualized as an age-related variable (typically as someone gets older their RT-OFTP decreases; Zacher & Frese, 2009), it would be reasonable to hypothesize that younger individuals have less confidence in their safety

performance. This could perhaps be due to lack of experience, training, and so on (Henry, Zacher, & Desmette, 2017). However, from the correlation matrix in Table 3 it can be determined there is an extremely small correlation between age and safety expectancy (r = .09) so this might not be the case because this relationship is in the opposite direction than in the model. Further, when supplemental regression analyses were conducted, it becomes clear that RT-OFTP is negatively related (or is not significantly related) with the safety motivation facets when it is included in a model with PO-OFTP. When remaining time OFTP is included in a model in isolation, there is a weak, positive relationship between RT-OFTP and each of the motivational facets it was hypothesized to share a relationship with in Model 2 (intrinsic valence, extrinsic valence, and safety expectancy).

Contributions to OFTP and safety performance. In Model 4, occupational time perspective was examined as a predictor of safety performance, and differential findings also emerged between PO-OFTP and RT-OFTP. PO-OFTP was positively and significantly related to all three types of safety performance, whereas RT-OFTP was not related to safety performance. As one perceives more opportunities ahead of them at work, they also report more safety compliance, safety participation, and safety initiative. This finding was predicted because previous job performance literature (e.g., Rudolph et al., 2018) has shown PO-OFTP is correlated with both task and contextual performance. Thus, when extending this to safety performance, similar relationships were expected and supported in the present study. Contrary to what was hypothesized, one's perceived remaining time at work was not related to their safety participation or safety initiative. Because there is a time component involved with both the construct of safety initiative and RT-OFTP (Curcuruto et al., 2018; Zacher & Frese, 2009), it was hypothesized that the relationship between RT-OFTP and safety initiative would be stronger than

the potential relationship between PO-OFTP and safety initiative (which was hypothesized to be more moderate). In the present research, these relationships did not reach significance. In practical terms, this can be viewed as a positive finding because employers can have some sort of influence on the perceived opportunities available to employees; however, it is more difficult to influence someone's time horizon at work because this may be more influenced by outside factors. This is discussed more in the practical implications section.

Contributions to the understanding of safety climate in OFTP and safety motivation relationships. The fourth goal of this study is to investigate the potential role of safety climate in strengthening or weakening the relationships between OFTP and safety motivation. Motivational researchers emphasize how the context plays a role in how employees form motivation (e.g., Diefendorff & Chandler, 2011; Kanfer et al., 2017). In the present study, the context of safety climate was examined to better understand the influence of time perspective on safety-related motivational components as defined by expectancy theory. None of the interaction terms were significant involving OFTP and safety climate in predicting safety motivation. The direct paths between perceived opportunities remaining at work and perceived remaining time at work and the motivational components were all still significantly related to the motivational facets when safety climate was taken into account (with the exception of the path between RT-OFTP and extrinsic valence of safety outcomes, which was non-significant in both Models 1 and 2). Thus, the results suggest that regardless of the context, the relationships between OFTP and the safety motivational facets are equally as strong.

It is possible that restrictions within the present study also contributed to the non-significant interaction that indicated safety climate does not meaningfully impact the relationship between occupational future time perspective and safety motivation. For instance, these results

could be due to the high-risk sample. Because the participants in the present study worked in safety critical industries and in roles that had some degree of risk to their personal safety or the public safety, it is possible there was not as much variance in safety climate to detect effects within this sample as there could be in a sample including employees from less safety critical roles. It could be possible in a less restrictive sample there would be a wider range of safety climate perceptions. For instance, research supports the notion that companies operating under higher risks, such as within the nuclear industry, must have positive safety cultures in order to survive (e.g., Oah, Na, & Moon, 2018).

Theoretical Contributions

Several well-established theories in the areas of motivation and lifespan were utilized in the present research. Contributions and application to these theories are discussed in the following sections.

Safety motivation and performance. As it was indicated previously, a theoretical contribution of this study was to expand the motivational construct domain by examining expectancy theory in the context of occupational safety. Expectancy theory reflects the process by which an individual's motivational force behind action is determined by the serious of judgements described as valence, instrumentality, and expectancy (Vroom, 1964). Researchers have suggested expectancy theory should be applied to the context of safety (Beus & Taylor, 2018). The present study responds to the call by examining the motivational force (valence of safety outcomes, instrumentality of safety outcomes, and safety expectancy) behind the action of safety performance. The results of the present study indicated support for the notion from expectancy theory that there are differential motivational drivers on varying types of performance (Vroom et al., 2015). The results of the present study also suggest employees are

more likely to engage in safety behaviors when they have higher valence, instrumentality, and expectancy; however, there were some nuanced restrictions to this statement that were discussed in the previous section.

In order to further test and understand the present variables within the expectancy theory domain, future investigation would be warranted. This additional investigation could include more thorough development of the expectancy theory components within the safety domain using qualitative interview methods. For instance, for use the present study, past research on safety motivation was referenced (Scott et al., 2014; Scott, 2016) to develop the valence, instrumentality, and expectancy items. These items were constructed by adapting general work motivation scale to the safety environment (Motivation at Work Scale; MAWS, Gagne et al., 2010). Future researchers could use a more comprehensive, qualitative approach to build potentially more comprehensive measures of why people work safely more specifically. It is possible that the current study does not best capture all of the intrinsic and extrinsic outcomes associated with working in a safety-critical role, and qualitative research could extricate more themes potentially missed in the present study or could rule out non-important or relevant themes included by the present study as well.

In addition to a refinement of measuring expectancy theory in the present context, future researchers could also have participants rank the types of safety motivation in how important they believe the facets contribute to safety performance. Although this is done statistically in the present study using path analysis, it would be useful to understand how employees perceive these rankings when asked to prioritize motivational facets in relation to one another.

Occupational future time perspective and safety motivation. Because the present study examines different components of safety motivation, this is a theoretical advantage.

Scholars have contended the relationship between age and work motivation may also differ depending on the specific type of work motivation in question, with this accentuating the need to examine different types of work motivation (Akkermans, 2016; Baltes et al., 2014; Kanfer and Ackerman, 2004).

Authors have also urged future researchers to "examine age-related differences in motives in different work contexts" (Kooij et al., 2011, p. 217) and to better understand "age-related factors that influence worker outcomes across their careers, because chronological age is limited in predicting these outcomes" (p. 430, Akkermans, 2016). This is particularly true because OFTP more strongly predicts work motivation than chronological age (Rudolph, 2018). Supplementary regression analyses from the present research study also confirmed OFTP as a stronger predictor of all safety motivation and safety performance facets than age (with the exception of safety importance, in which chronological age was a stronger predictor than OFTP). It is important to note that age was still a significant predictor, though not as strong. This study has implications for theories on work motivation such that it has the potential to further build evidence of understanding lifespan constructs (particularly that of OFTP) in the context of safety motivation. Other studies have demonstrated this need (e.g., Kooij & Van De Voorde, 2011), and researchers have stressed the importance of considering intra-individual development variables such as FTP in research, because many studies have focused on inter-individual differences (Kanfer & Ackerman, 2004). According to Kooij and Kanfer (2004), "incorporating (perceived) time is likely to improve predictions of work motivation theories" (p. 488).

In the present study, motivation was examined in conjunction with lifespan development theory, and a person's perceived amount of opportunities and time left at work were considered as potential influential factors in safety motivation (valence of safety outcomes, instrumentality

of safety outcomes, and safety expectancy). Results of the present study partially confirmed what would be hypothesized using lifespan theory. Results (Model 1) showed the relationships between the two types of OFTP on safety motivation facets were very different. Whereas one's perceived remaining opportunities at work (PO-OFTP) was positively and significantly related to all motivational facets, one's perceptions of remaining time (RT-OFTP) was negatively related to intrinsic valence of safety outcomes and safety expectancy.

According to Socioemotional Selectivity Theory, as an individuals' time horizon decreases, they prioritize socioemotional goals; as their horizon increases, they prioritize more instrumental goals (Carstensen, 1999). Thus, in the present study, we would expect those with higher/more expansive time perspectives to share negative relationships with intrinsic types of motivation (because more time left is theoretically linked with less socioemotional, or intrinsic-type rewards that are typically intrinsically related) and positively relationships with extrinsic types of motivation (because more time left is theoretically linked with extrinsic or instrumental outcomes like financial or recognition rewards; Carstensen, 1999).

Consistent with this theory, it was found that higher perceptions of opportunities (related to a longer horizon at work) was positively related to higher ratings of extrinsic valence and instrumentality of safety outcomes. It was also found that a higher remaining time OFTP (also related to a longer horizon) was associated with less intrinsic valence of safety outcomes. This finding is consistent with the theoretical notion that greater amounts of perceived time left would be associated with employees placing less value on intrinsic outcomes. However, some deviations from what were theoretically expected were found. For instance, higher perceived opportunities in the future was associated with higher intrinsic valence and instrumentality of safety outcomes. This was with predictions based on socioemotional selectivity theory, that PO-

OFTP would have a negative relationship with intrinsic valence and instrumentality. Further, there was not a significant relationship between RT-OFTP and extrinsic valence of safety outcomes, thus the theoretical proposition that greater amounts of perceived time would be associated with a greater value on extrinsic outcomes was not supported. Thus, partial theoretical support was found.

The additional findings involving PO-OFTP, intrinsic valence, and intrinsic instrumentality of safety outcomes were not in accordance with theoretical expectations. Because someone becomes less interested over time in instrumental/extrinsic outcomes and more in intrinsic outcomes (Lang & Carstensen, 2002), it was expected this would translate to the relationships in the present study such that there would be negative relationship between PO-OFTP and intrinsic valence and instrumentality, though this was not the case. As one's opportunities increased, there were associated increases in all facets of safety motivation. It is possible additional theory could explain these relationships better than the theory utilized in the present study (socioemotional selectivity theory). In the present study, it was found that perceptions of greater opportunities in the future are positively associated with every facet of safety motivation. Thus, lifespan did not play a large role in all of these relationships. The results could potentially be better explained by a different theory, such as job demands resources theory (JD-R theory). According to JD-R theory (Demerouti et al., 2001; Bakker & Demerouti, 2017), motivation is influenced by one's perceived job resources and job demands. Job demands are aspects of the job that require effort and are stressors when a person cannot meet them. These can be production pressure, social conflict, or strenuous conditions. Job resources as aspects of the job that help someone to deal with job demands, such as supervisor support, organizational resources (e.g., pay), and the nature of the work (e.g., autonomy). In the present study, the

amount of future opportunities an individual feels are available to them at work could be considered to be a job resource. Thus, there is potential that PO-OFTP is in fact not as closely related to time horizons as suggested in the present research and is more applicable when considered as a job resource. If this is the case, the positive relationships found between PO-OFTP and all safety motivational types would be fully supported by JD-R theory.

Practical Implications

Safety motivation and performance. By testing a more comprehensive understanding of safety motivation and differential relationships associated with varying types of safety performance, safety professionals may recognize more readily what is needed to motivate one type of safety behavior over another (Curcuruto et al., 2019). According to the present study, practitioners could have a particular emphasis on safety expectancy.

Safety expectancy describes an individual's beliefs in their ability to enact safety behaviors or to work safely. In the present study, participants responded to the prompt "If I work hard, I am capable of…" while considering each of the 13 safety performance items. Based on the current findings, practitioners could explore ways to increase these feelings of capability in employees. Research has demonstrated training, opportunities to practice skills, having leaders provide feedback and check-ins to be effective in boosting performance self-efficacy of employees (Lunenburg, 2011). Practitioners should think of how they can show employees how their efforts will in fact lead to desired safety performance. Because much of the nature of safety is preventative, outcomes are not necessarily "visible" when the presence of safety is often the absence of an accident or something negative. Perhaps practitioners can think of ways to show employees they are being successful with safety performance on a regular basis, to remind them the "absence" of any incidents is often the "presence" of safety performance.

Researchers have also suggested leaders can focus on reflective questions to strengthen the effort–performance link for their employees (Isaac, Zerbe, & Pitt, 2001). These might include, “Does my follower feel able to perform the task? Is more education, training and/or experience warranted?”, “Does my follower possess the self-confidence required to do the job? Do I need to spend more time with this individual to raise the level of confidence?”, and “What constitutes acceptable performance for my follower and are we both sure we know this and agree? Do we have concrete measures of [safety] performance to monitor?” (Isaac, Zerbe, & Pitt, 2001). By reflecting on these questions, leaders can figure out where to best support their followers in building expectancy.

It is worth noting the close link between safety performance, safety motivation, and expectancy. Historically, performance was viewed as a multiplicative function of motivation and ability (e.g., Maier, 1955; Vroom, 1964; Porter & Lawler, 1968). Van Iddekinge et al. (2018) recently challenged this notion, demonstrating empirically that the multiplicative model does not explain more variance beyond the additive effects of the model, and it only accounted for a small percentage of the explained variance in performance. Nonetheless, ability is a critical component in performance, and expectancy captures one’s perceived ability in successfully performing the safety behavior. Not only is this a critical component as described in the present study and by expectancy theory (Vroom, 1964), but it is a critical component as described by motivation and performance theory more generally (Van Iddekinge et al., 2018). Whenever practitioners can help develop the ability and self-efficacy of their employees, this opportunity should be pursued.

Occupational future time perspective, safety motivation, and safety performance. Now more than ever organizations recognize the importance of retaining and motivating workers across all stages of the lifespan (Crawford, 2016). The present study helps to identify which

components of safety motivation are more or less influenced by one's perception of time and opportunities remaining, allowing practitioners to target perceptions of perceived opportunities rather than remaining time left.

A practical advantage to examining OFTP above and beyond age is that organizations may be able to improve the future time perspective of their employees. It has been demonstrated that employees behave differently based on their FTP. For instance, people network more for social/community reasons when they have a restricted FTP, and network for political/career reasons when they have an expansive FTP (Treadway et al., 2010). The present study shows this holds true for safety behavior, thus these findings could potentially inform researchers and practitioners to develop a wider range of tools to shape OFTP. The way in which a company or a leader might do this would certainly vary across contexts, though researchers have provided examples and successful interventions. "For example, organizations could aim to lengthen older workers' time perspective by specifically outlining their future within the company (see also, Carstensen et al., 1999), thereby increasing their occupational well-being" (p. 101, Kooij et al., 2013). This has also been done successfully using computer-based scenarios that elicited different goals underlying task completion (Hoppmann & Blanchard-Fields, 2010).

The results of the present study demonstrated it would be more advantageous to focus on developing or building perceptions of opportunity rather than perceived time, because PO-OFTP shared positive significant relationships with all types of safety performance. Practitioners can begin to work with employees to reflect more on the opportunities they might have in the future (if these opportunities exist) or to actually build additional opportunities for the future (if they do not exist). Another opportunity for to help employees gain a greater sense of future opportunities could be through job crafting, by crafting ways to set and accomplish new workplace goals in the

future (Kooij et al., 2017). Leaders need to ensure they are cultivating an environment in which workers, particularly older workers, have opportunities to contribute and engage in challenging tasks and autonomy (Zacher & Frese, 2011).

Limitations

As with any study, potential threats to internal and external validity could be present. There are some possible concerns regarding the structure of the study that could be a question to the internal validity. For instance, there are limitations inherent to the process of measuring motivation. Because this is an internal variable that cannot be seen, researchers (including myself in the present study) mostly rely on self-report data, which can be contaminated by errors like memory flaws, social desirability, and more (Yeheyis et al., 2016). An additional potential limitation in the present study could be how safety expectancy was measured. In the present study, participants responded to the prompt "If I work hard, I am capable of…" while considering each of the 13 safety performance items. A similar approach has been utilized in past research measuring expectancy (e.g., Chiang & Jang, 2008) and also closely reflects safety-self efficacy measurement approaches (e.g., Curcuruto et al., 2019; Nykänen et al., 2019). (These items can be found in Appendix B.) Although this approach is commonly used, a potential limitation to this approach is that the strong relationships between safety expectancy and safety performance that were found in the present study could be due to a measurement confound, because the same items (with a different instructional referent) were used to measure expectancy and performance.

Additional threats can be introduced if participants were not familiar with the safety-specific language used in the pre-established measures in the present study or if items were not applicable to their role or workplace. For instance, an item asks participants if their supervisor

insists that “we obey safety rules when fixing equipment or machines,” though it is possible someone works in a role or environment where maintenance of any kind is not needed.

Further, there are potential shortcomings in regard to how well the present findings might be applicable to other populations outside of the present sample (external validity). When generalizing the findings from the present study to the general population, a few considerations could be useful. The sample in the present study was comprised of individuals who experience some degree of risk to their personal safety and/or to public safety. Additionally, the sample was predominately white, male, non-management, held some college education, had experienced an injury on the job, and the average age was 38.39. Depending on the workforce in which generalizations will be made, these sample characteristics might not be an accurate comparison. However, if one is interested in generalizing to a sample primarily working within the sample characteristics specified and within safety-critical industries such as health care and social assistance, retail trade, manufacturing, and construction (please see Appendix A), better conclusions of generalization can be made.

An additional limitation can be marked by the race/ethnicity question in the present study. A response option for Hispanic or Latinx Ethnicity was missing as an error, and as a result 4% of the sample selected the “other” option. This is a limitation because detail in the sample was not documented.

Future Research

Throughout the discussion, several points of future research were suggested. For instance, it would be useful to more deeply examine why a negative relationship emerged between RT-OFTP and safety expectancy, as well as what resources (internal and external) might be contributing to the strong relationships between safety expectancy and safety performance. In

addition to this, empirical research is needed to determine the degree to which OFTP (both PO and RT) can be modified or changed in the workplace, and how outcomes are impacted as a result. Currently, research is sparse on this topic, though it shows promise. Some researchers have suggested that OFTP can change. For instance, Bal et al. (2015) reported that the more workers of old age perceived they were negatively stereotyped by their younger colleagues, the more their OFTP was reduced. Further, Zacher and Yang (2016) found that an organizational climate for successful aging, defined as shared perceptions about organizational practices to facilitate successful aging at work, was positively associated with focus on opportunities.

Other researchers have gone a step further to try and manipulate OFTP. Barber et al. (2016) created writing activities to direct participants in thinking of their horizon as restricted or expansive (in order to momentarily manipulate OFTP), then tested emotional and cognitive responses to stimuli. They showed it was possible to manipulate one's positivity in attention, simulating age-related effects associated with horizon in both younger and older adults (in alignment with Socioemotional Selectivity Theory). Studies of this sort should be conducted in a workplace setting, using outcomes that are important to companies such as safety performance or attitudes about safety.

Similarly, future researchers should attempt to manipulate the motivational facets as described by safety expectancy in the present study and measure any resulting changes in safety performance as a result. This would offer a greater indication of differential impact and guide safety interventions in the future to help distinguish influential areas of focus.

Finally, in the present study, safety climate was not a moderator of the relationships between OFTP and safety motivation. Future research could examine additional contextual influences in potentially driving these relationships, such as characteristics from Job

Characteristics Theory, which explains how there are five key features of a job that enhance or harm work motivation among other important outcomes (Humphrey et al., 2007). The five key features are skill variety (e.g., the ability for the person to use a diverse array of skills), task significance (e.g., feeling as if the job has a positive impact), task identity (e.g., the ability for the worker to understand how their work fits into a larger picture of the business or mission), autonomy, and feedback.

Conclusion

The results of the present study indicated that expectancy theory can offer unique and valuable motivational predictors of safety behavior above and beyond the currently used approach of safety importance motivation. Further, the present study demonstrated how occupational future time perspective, particularly how an employee perceives their future opportunities at work, can provide insight into safety motivation and safety behavior.

Table 3

Correlation matrix for all variables in the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Valence of SO	1																				
2. Extrinsic Valence of SO	.855**	1																			
3. Intrinsic Valence of SO	.886**	.518**	1																		
4. Instrumentality of SO	.590**	.418**	.601**	1																	
5. Extrinsic Instrumentality of SO	.492**	.466**	.395**	.888**	1																
6, Intrinsic Instrumentality of SO	.563**	.286**	.673**	.900**	.600**	1															
7. Safety Expectancy	.457**	.296**	.490**	.550**	.430**	.551**	1														
8. Safety Importance Motivation	.426**	.329**	.410**	.404**	.319**	.402**	.542**	1													
9. Safety Compliance	.276**	.179**	.297**	.442**	.381**	.408**	.508**	.529**	1												
10. Safety Participation	.262**	.097*	.345**	.444**	.356**	.437**	.524**	.160**	.319**	1											
11. Safety Initiative	.222**	0.04	.328**	.429**	.320**	.444**	.477**	.080*	.206**	.778**	1										
12. Safety Climate	.325**	.200**	.358**	.518**	.469**	.459**	.468**	.238**	.452**	.423**	.366**	1									
13. OFTP	.208**	.186**	.178**	.264**	.263**	.211**	.264**	.150**	.135**	.322**	.222**	.240**	1								
14. RT-OFTP	.127**	.138**	.086*	.180**	.219**	.106**	.140**	0.03	.078*	.235**	.151**	.158**	.902**	1							
15. PO-OFTP	.249**	.198**	.234**	.297**	.257**	.274**	.335**	.237**	.166**	.347**	.250**	.274**	.906**	.634**	1						
16. Age	0.00	-.095*	.082*	0.05	-0.03	.121**	.093*	.186**	.152**	-0.06	0.00	-0.02	-.576**	-.613**	-.429**	1					
17. CFSC	.240**	.149**	.264**	.287**	.212**	.299**	.389**	.640**	.544**	0.08	0.04	.272**	0.03	-0.04	.101*	.226**	1				
18. Personal Risk	.131**	0.06	.166**	.185**	.164**	.167**	.192**	.215**	.154**	.280**	.230**	.133**	.214**	.179**	.208**	-0.03	.129**	1			
19. Public Risk	0.05	0.00	.088*	0.07	0.05	.080*	.090*	0.06	.101**	.198**	.149**	.124**	.114**	.105**	.101*	-0.06	0.04	.386**	1		
20. Gender	-.105**	-.091*	-.091*	-0.07	-0.04	-.093*	0.00	-0.02	-0.08	0.04	0.00	0.01	0.07	0.04	0.07	-0.07	-0.05	.089*	-0.04	1	
21. Injury	0.04	0.04	0.03	0.06	0.07	0.03	0.01	0.00	.087*	-0.03	-0.05	.128**	0.06	.077*	0.04	-.108**	.109**	-.167**	-.098*	-.091*	1

Note. **Correlation is significant at the 0.01 level, *Correlation is significant at the .05 level; Gender: Female (1), Male (2); Injury: Yes (1), No (2); SO = Safety Outcomes; CFSC = Consideration of Future Safety Consequences; N = 650

Table 4

Age by Sample

	Full Sample	MTURK Sample	Working Sample
	M(SD)	*M(SD)*	*M(SD)*
Age	38.39 (11.18)	38.5 (11.09)	37.64 (11.7)

Table 5

Gender, Race, and Educational Level by Sample

	Full Sample		MTURK Sample		Working Sample	
	N	*%*	*N*	*%*	*N*	*%*
Female	281	43.2	246	43.4	35	42.2
Male	367	56.5	319	56.3	48	57.8
Other	2	0.3	2	0.4	0	0.0
Total	650	100	567	100.0	83	100.0
White	517	79.5	443	78.1	74	89.2
Black or African American	63	9.7	60	10.6	3	3.6
American Indian or Alaskan Native	3	0.5	3	0.5	0	0.0
Asian	40	6.2	38	6.7	2	2.4
Native Hawaiin or Pacific Islander	1	0.2	1	0.2	0	0.0
Other	26	4.0	22	3.9	4	4.8
Total	650	100	567	100.0	83	100.0
Less than High School	1	0.2	1	0.2	0	0.0
High School Graduate	75	11.5	69	12.2	6	7.2
Some College	159	24.5	145	25.6	14	16.9
2 Year Degree	103	15.8	95	16.8	8	9.6
4 Year Degree	229	35.2	197	34.7	32	38.6
Professional Degree	72	11.1	56	9.9	16	19.3
Doctorate	11	1.7	4	0.7	7	8.4
Total	650	100	567	100.0	83	100.0

Table 6
Work Related Injury and Job Position by Sample

	Full Sample		MTURK Sample		Working Sample	
	N	%	*N*	%	*N*	%
Yes; Work-Related Injury	354	54.5	311	54.9	43	51.8
No; Work-Related Injury	295	45.4	255	45.0	40	48.2
Missing	1	0.2	1	0.2	0	0.0
Total	650	100.0	567	100.0	83	100.0
Non-Supervisory/Non-Management	294	45.2	252	44.4	42	50.6
Supervisory	205	31.5	179	31.6	26	31.3
Middle Level Management	124	19.1	114	20.1	10	12.0
Upper Level Management	26	4.0	21	3.7	5	6.0
Missing	1	0.2	1	0.2	0	0.0
Total	650	100.0	567	100.0	83	100.0

Table 7
Personal and Public Safety Risks Involved with Job

	Full Sample		MTURK Sample		Working Sample	
	N	%	*N*	%	*N*	%
Personal Risk						
Not at all	7	1.1	7	1.2	0	0.0
A small extent	133	20.5	114	20.1	19	22.9
Some extent	262	40.3	243	42.9	19	22.9
A large extent	164	25.2	137	24.2	27	32.5
A very large extent	84	12.9	66	11.6	18	21.7
Total	650	100.0	567	100.0	83	100.0
Public Risk						
Not at all	104	16.0	92	16.2	12	14.5
A small extent	193	29.7	181	31.9	12	14.5
Some extent	176	27.1	163	28.7	13	15.7
A large extent	98	15.1	75	13.2	23	27.7
A very large extent	79	12.2	56	9.9	23	27.7
Total	650	100.0	567	100.0	83	100.0

Note. Items read "To what extent does your job involve risks to your personal safety [or public safety]?"

Table 8

Industries Worked by Sample

	Full Sample	MTURK Sample	Working Sample
	N	*N*	*N*
Agriculture, forestry, fishing and hunting	40	37	3
Construction	94	79	15
Education	26	23	3
Financial activities	15	15	0
Health care and social assistance	193	150	43
Information	38	37	1
Leisure and hospitality	34	34	0
Manufacturing	96	89	7
Mining, quarrying, oil and gas extraction	2	2	0
Professional and business services	51	44	7
Religious, grantmaking, civic, professional, and similar orgs	8	8	0
Retail trade	135	134	1
Transportation and warehousing	61	59	2
Utilities	27	18	9
Waste management and remediation services	4	4	0
Wholesale Trade	17	17	0
None of the above	5	0	5

Note. Participants were permitted to select more than one industry.

Table 9

Means and Standard Deviations of the Variables by Sample

	Full Sample				MTURK Sample			Working Adult Sample		
	M	*α*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*
Valence of Safety Outcomes	5.64	0.83	0.80	650	5.62	0.82	567	5.77	0.68	83
Extrinsic Valence of Safety Outcomes	5.67	0.69	0.87	650	5.68	0.88	567	5.64	0.80	83
Intrinsic Valence of Safety Outcomes	5.61	0.85	0.97	650	5.57	0.98	567	5.89	0.85	83
Instrumentality of Safety Outcomes	5.42	0.87	0.91	650	5.42	0.92	567	5.37	0.80	83
Extrinsic Instrumentality of Safety Outcomes	5.37	0.76	0.99	650	5.40	1.00	567	5.13	0.89	83
Intrinsic Instrumentality of Safety Outcomes	5.46	0.88	1.04	650	5.44	1.06	567	5.60	0.91	83
Safety Expectancy	5.75	0.92	0.85	650	5.74	0.86	567	5.80	0.74	83
Safety Importance Motivation	6.35	0.83	0.77	650	6.33	0.80	567	6.50	0.54	83
Safety Compliance	6.00	0.92	1.00	650	6.00	1.02	567	6.01	0.89	83
Safety Participation	4.17	0.94	1.57	650	4.21	1.56	567	3.88	1.58	83
Safety Initiative	3.89	0.95	1.74	650	3.92	1.74	567	3.63	1.67	83
Occupational Future Time Perspective (OFTP)	4.76	0.87	1.21	650	4.72	1.21	567	5.04	1.23	83
Remaining Time OFTP	4.26	0.74	1.33	650	4.23	1.31	567	4.44	1.44	83
Perceived Opportunities OFTP	5.27	0.92	1.35	650	5.22	1.35	567	5.64	1.30	83
Safety Climate	5.07	0.97	1.32	650	5.07	1.35	567	5.07	1.14	83

Table 10
Summary of all results

Hypothesis or Research Question	Supported?
Hypothesis 1: Perceived Opportunities OFTP will be negatively related to intrinsic valence of safety outcomes (H1a) and positively related to extrinsic valence of safety outcomes (H1b).	H1a: Not supported H1b: Supported
Hypothesis 2: Remaining Time OFTP will be negatively related to intrinsic valence of safety outcomes (H2a) and positively related to extrinsic valence of safety outcomes (H2b).	H2a: Supported H2b: Not supported
Hypothesis 3: Perceived Opportunities OFTP will be positively related to both (H3a) intrinsic instrumentality of safety outcomes and (H3b) extrinsic instrumentality of safety outcomes.	H3a: Supported H3b: Supported
Hypothesis 4: Perceived Opportunities OFTP will be positively related to safety expectancy.	H4: Supported
Hypothesis 5: Remaining Time OFTP will be positively related to safety expectancy.	H5: Not supported
Hypothesis 6: The relationship between Perceived Opportunities (PO-OFTP) and components of safety motivation will be moderated by safety climate such that the relationship between PO-OFTP and (H6a) intrinsic valence of safety outcomes, (H6b) extrinsic valence of safety outcomes, (H6c) intrinsic instrumentality of safety outcomes, (H6d) extrinsic instrumentality of safety outcomes, and (H6e) safety expectancy will be weaker when employees perceive to be working in a positive safety climate (and stronger when they perceive to be working in a weaker safety climate).	H6a: Not supported H6b: Not supported H6c: Not supported H6d: Not supported H6e: Not supported
Hypothesis 7: The relationship between Remaining Time (RT-OFTP) and components of safety motivation will be moderated by safety climate such that the relationship between RT-OFTP and (H7a) intrinsic valence of safety outcomes, (H7b) extrinsic valence of safety outcomes, and (H7c) safety expectancy will be weaker when employees perceive to be working in a positive safety climate (and stronger when they perceive to be working in a weaker safety climate).	H7a: Not supported H7b: Not supported H7c: Not supported H7d: Not supported
Hypothesis 8: There will be a positive relationship between valence of safety outcomes and safety compliance (H8a), safety participation (H8b), and safety initiative (H8c).	H8a: Not supported H8b: Not supported H8c: Not supported
Hypothesis 9: There will be a positive relationship between instrumentality of safety outcomes and safety compliance (H9a), safety participation (H9b), and safety initiative (H9c).	H9a: Supported H9b: Supported H9c: Supported
Hypothesis 10: There will be a positive relationship between expectancy and safety compliance (H10a), safety participation (H10b), and safety initiative (H10c). These relationships will be stronger between expectancy and safety participation and initiative (the two types of citizenship performance) than between expectancy and safety compliance (task-related performance; H10d).	H10a: Supported H10b: Supported H10c: Supported H10d: Supported

Hypothesis 11: There will be a positive relationship between safety importance and safety compliance (H11a), safety participation (H11b), and safety initiative (H11c). The relationship between importance and compliance will be stronger than the relationships between importance and the two types of safety citizenship-related behavior (performance and safety initiative; H11d).	H11a: Supported H11b: Not supported H11c: Not supported H11d: Supported
Hypothesis 12: There will be a significant relationship between Perceived Opportunities OFTP and safety compliance.	H12: Supported
Hypothesis 13: Both (H13a) Perceived Opportunities OFTP and (H13b) Remaining Time OFTP will be related to safety participation, though (H13c) PO-OFTP will have a stronger relationship with safety participation than RT-OFTP.	H13a: Supported H13b: Not supported H13c: Supported
Hypothesis 14: Both (H14a) PO-OFTP and (H14b) RT-OFTP will be related to safety initiative, though (H14c) RT-OFTP will have a stronger relationship with safety initiative than PO-OFTP.	H14a: Supported H14b: Not supported H14c: Not supported
Research Question 1: There will be a positive relationship between intrinsic valence of safety outcomes and (RQ1a) safety compliance, (RQ1b) safety participation, (RQ1c) and safety initiative. The relationships between intrinsic valence of safety outcomes and the two types of citizenship performance (safety participation and safety initiative) will be stronger than the relationship between intrinsic valence and safety compliance (task-related performance) (RQ1d).	RQ1a: Not supported RQ1b: Supported RQ1c: Supported RQ1d: Supported
Research Question 2: There will be a positive relationship between extrinsic valence of safety outcomes and safety compliance.	RQ2: Not supported
Research Question 3: There will be a positive relationship between intrinsic instrumentality of safety outcomes and (RQ3a) safety compliance, (RQ3b) safety participation, (RQ3c) and safety initiative. The relationships between intrinsic instrumentality of safety outcomes and the two types of citizenship performance (safety participation and safety initiative) will be stronger than the relationship between intrinsic instrumentality and safety compliance (task-related performance) (RQ3d).	RQ3a: Not supported RQ3b: Supported RQ3c: Supported RQ3d: Supported
Research Question 4: There will be a positive relationship between extrinsic instrumentality of safety outcomes and safety compliance.	RQ4: Supported

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APPENDIX A

List of safety-critical industries: Industries with highest fatality rates from the Bureau of Labor Statistics (2018, data from 2017)

- Agriculture, forestry, fishing and hunting (e.g., support activities for forestry and agriculture, crop production, animal production, logging)
- Mining, quarrying, oil and gas extraction
- Construction (e.g., specialty trade contractors, construction of buildings, heavy and civil engineering construction)
- Manufacturing (e.g., petroleum and coal products manufacturing, plastics and rubber products manufacturing, machinery manufacturing, equipment manufacturing, furniture manufacturing)
- Wholesale Trade (e.g., merchant wholesalers durable goods or nondurable goods, wholesale electronic markets and agents and brokers)
- Retail trade (e.g., motor vehicle and parts dealing, food and beverage stores)
- Transportation and warehousing (e.g., warehousing and storage, truck transportation, air or rail transportation, pipeline transportation, postal service)
- Utilities
- Waste management and remediation services
- Health care and social assistance (e.g., hospitals, nursing, social assistance, emergency and other relief services)

List of additional industries

- Information (e.g., data processing, broadcasting, telecommunications, internet publishing)
- Financial activities (e.g., finance and insurance, real estate and rental leasing)
- Professional and business services (e.g., management; administrative support; professional, scientific, and technical services)
- Education
- Leisure and hospitality (e.g., food services, drinking places, museums, historical sites, amusement, recreation)
- Religious, grantmaking, civic, professional, and similar organizations

Item as it will appear in MTurk:
Have you worked in one of the following industries outside of MTurk within the last 12 months?

- ☐ Agriculture, forestry, fishing and hunting (e.g., support activities for forestry and agriculture, crop production, animal production, logging)
- ☐ Construction (e.g., specialty trade contractors, construction of buildings, heavy and civil engineering construction)

- ☐ Education
- ☐ Financial activities (e.g., finance and insurance, real estate and rental leasing)
- ☐ Health care and social assistance (e.g., hospitals, nursing, social assistance, emergency and other relief services)
- ☐ Information (e.g., data processing, broadcasting, telecommunications, internet publishing)
- ☐ Leisure and hospitality (e.g., food services, drinking places, museums, historical sites, amusement, recreation)
- ☐ Manufacturing (e.g., petroleum and coal products manufacturing, plastics and rubber products manufacturing, machinery manufacturing, equipment manufacturing, furniture manufacturing)
- ☐ Mining, quarrying, oil and gas extraction
- ☐ Professional and business services (e.g., management; administrative support; professional, scientific, and technical services)
- ☐ Religious, grantmaking, civic, professional, and similar organizations
- ☐ Retail trade (e.g., motor vehicle and parts dealing, food and beverage stores)
- ☐ Transportation and warehousing (e.g., warehousing and storage, truck transportation, air or rail transportation, pipeline transportation, postal service)
- ☐ Utilities
- ☐ Waste management and remediation services
- ☐ Wholesale Trade (e.g., merchant wholesalers durable goods or nondurable goods, wholesale electronic markets and agents and brokers)
- ☐ **I have not worked in an industry outside of MTurk for more than 30 hours a week on average within the last 12 months**

Additional safety-critical work screening items:

- To what extent does your job involve risks to your personal safety?
  - Not at all, (2) A small extent, (3) Some extent, (4) A large extent, (5) A very large extent
- To what extent does your job involve risks to the safety of the public?
  - Not at all, (2) A small extent, (3) Some extent, (4) A large extent, (5) A very large extent

APPENDIX B

Occupational Future Time Perspective Items (Zacher & Frese, 2009)

- Remaining Time Dimension
    1. Most of my occupational life lies ahead of me
    2. My occupational future seems infinite to me
    3. As I get older, I begin to experience time in my occupational future as limited [reverse coded]
- Perceived Opportunities Dimension
    1. Many opportunities await me in my occupational future
    2. I expect that I will set many new goals in my occupational future
    3. My occupational future is filled with possibilities

Valence of Safety Outcomes Items (Developed for the present study; Safety outcomes from Scott, 2016)

- "There are many reasons why one might perform their job safely. Please indicate how desirable you find the following reasons for working safely…"
    - Extrinsic
        1. Keeping my job (Because I risk losing my job if I don't)
        2. Avoiding being criticized by others (e.g., supervisor, colleagues, family, clients...)
        3. Getting approval from others (e.g., supervisor, colleagues, family, clients...)
        4. Getting a reward
        5. Avoiding injury
    - Intrinsic
        1. Feeling satisfaction
        2. Feeling pride
        3. Having interest
        4. Experiencing accomplishment
        5. Feeling alignment between my personal values and actions

Instrumentality of Safety Outcomes Items (Developed for the present study, Safety outcomes from Scott, 2016)

- "When I perform my job safely, this will definitely result in my…"
    - Extrinsic outcomes
        1. Keeping my job (Because I risk losing my job if I don't)
        2. Avoiding being criticized by others (e.g., supervisor, colleagues, family, clients...)
        3. Getting approval from others (e.g., supervisor, colleagues, family, clients...)
        4. Getting a reward
        5. Avoiding injury
    - Intrinsic outcomes
        1. Feeling satisfaction
        2. Feeling pride
        3. Having interest
        4. Experiencing accomplishment

5. Feeling alignment between my personal values and actions

Safety Expectancy Items

- "If I work hard, I am capable of…" while considering each of the 14 safety performance items, outlined in the sections below (three safety compliance items, six safety participation items, 4 safety initiative items). They will respond using a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).
- Safety Compliance Items (Neal & Griffin, 2006; Neal, Griffin, & Hart, 2000)
    - Using all the necessary safety equipment to do my job
    - Using the correct safety procedures for carrying out my job
    - Ensuring the highest levels of safety when I carry out my job
- Safety Participation Items (Hofmann, Morgeson, & Gerras, 2003)
    - 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
    - Helping others with safety related responsibilities
- Safety Initiative Items (Hofmann et al., 2003)
    - Changing the way the job is done to make it safer
    - Changing policies and procedures to make them safer
    - Improving safety procedures
    - Making suggestions to improve the safety of a work activity

Safety Importance Items (Neal & Griffin, 2006; Neal, Griffin, & Hart, 2000)

1. I feel that it is worthwhile to put in effort to maintain or improve my personal safety
2. I feel that it is important to maintain safety at all times
3. I believe that it is important to reduce the risk of accidents and incidents in the workplace

Safety Compliance Items (Neal & Griffin, 2006)

1. I use all the necessary safety equipment to do my job
2. I use the correct safety procedures for carrying out my job
3. I ensure the highest levels of safety when I carry out my job

Safety Participation Items (Hofmann et al., 2003)

1. Volunteering for safety committees
2. Helping teach safety procedures to new crew members
3. Assisting others to make sure they perform their work safely
4. Getting involved in safety activities to help my crew work more safely
5. Helping other crew members learn about safe work practices
6. Helping others with safety related responsibilities

Safety Initiative Items (Hofmann et al., 2003; Curcuruto et al., 2019)

1. Trying to change the way the job is done to make it safer
2. Trying to change policies and procedures to make them safer
3. Trying to improve safety procedures

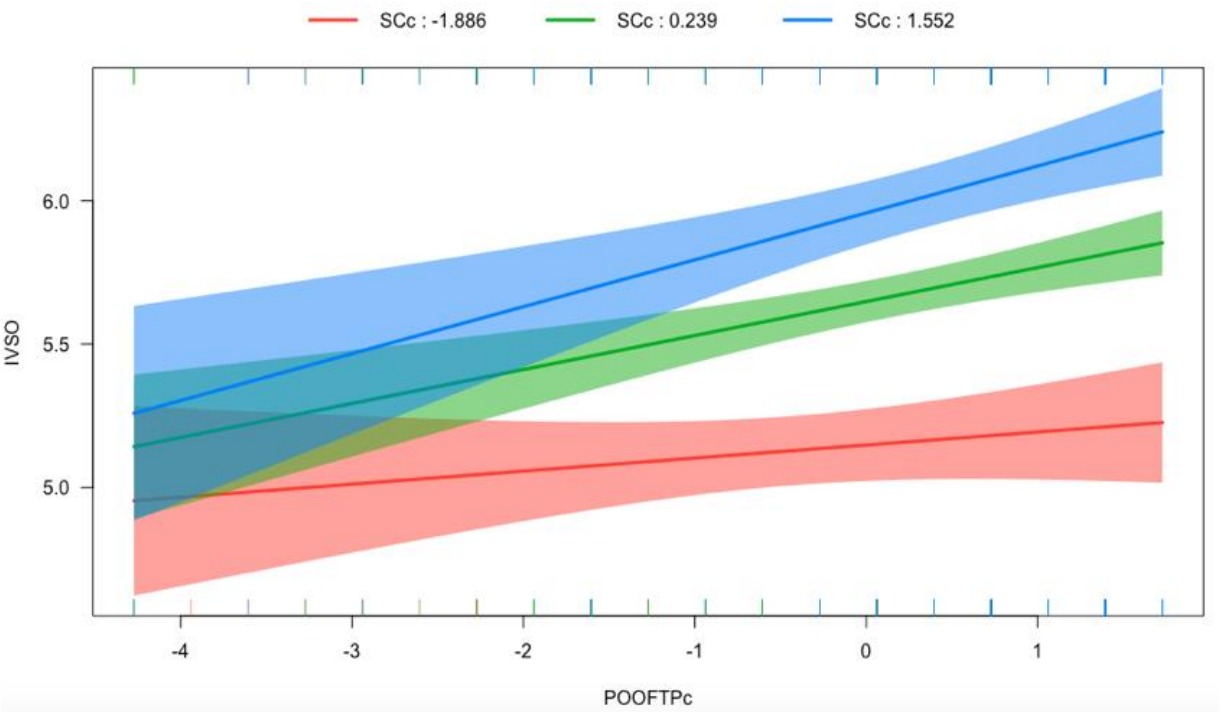
4. Making suggestions to improve the safety of a work activity

Safety Climate Items (Zohar & Luria, 2005)

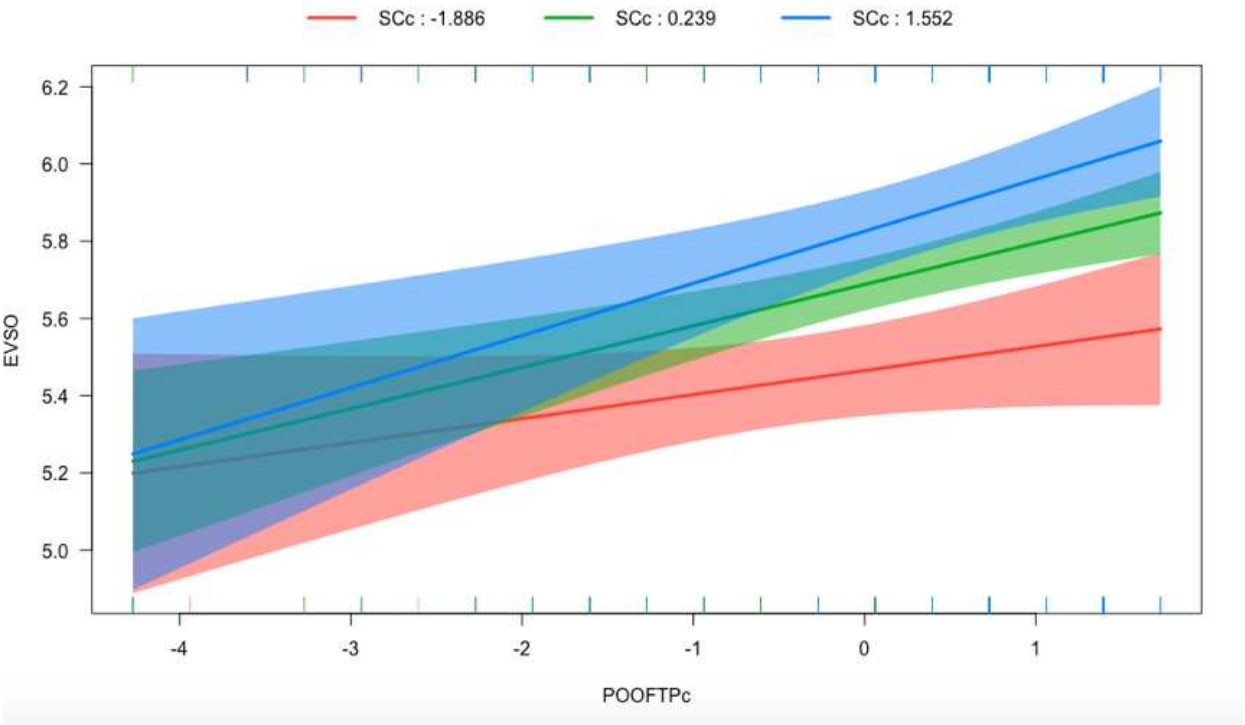
- My direct supervisor . . .
  1. Makes sure we receive all the equipment needed to do the job safely.
  2. Frequently checks to see if we are all obeying the safety rules.
  3. Discusses how to improve safety with us.
  4. Uses explanations (not just compliance) to get us to act safely.
  5. Emphasizes safety procedures when we are working under pressure.
  6. Frequently tells us about the hazards in our work.
  7. Refuses to ignore safety rules when work falls behind schedule.
  8. Is strict about working safely when we are tired or stressed.
  9. Reminds workers who need reminders to work safely.
  10. Makes sure we follow *all* the safety rules (not just the most important ones).
  11. Insists that we obey safety rules when fixing equipment or machines.
  12. Says a "good word" to workers who pay special attention to safety
  13. Is strict about safety at the end of the shift, when we want to go home.
  14. Spends time helping us learn to see problems *before* they arise.
  15. Frequently talks about safety issues throughout the work week.
  16. Insists we wear our protective equipment even if it is uncomfortable.

APPENDIX C

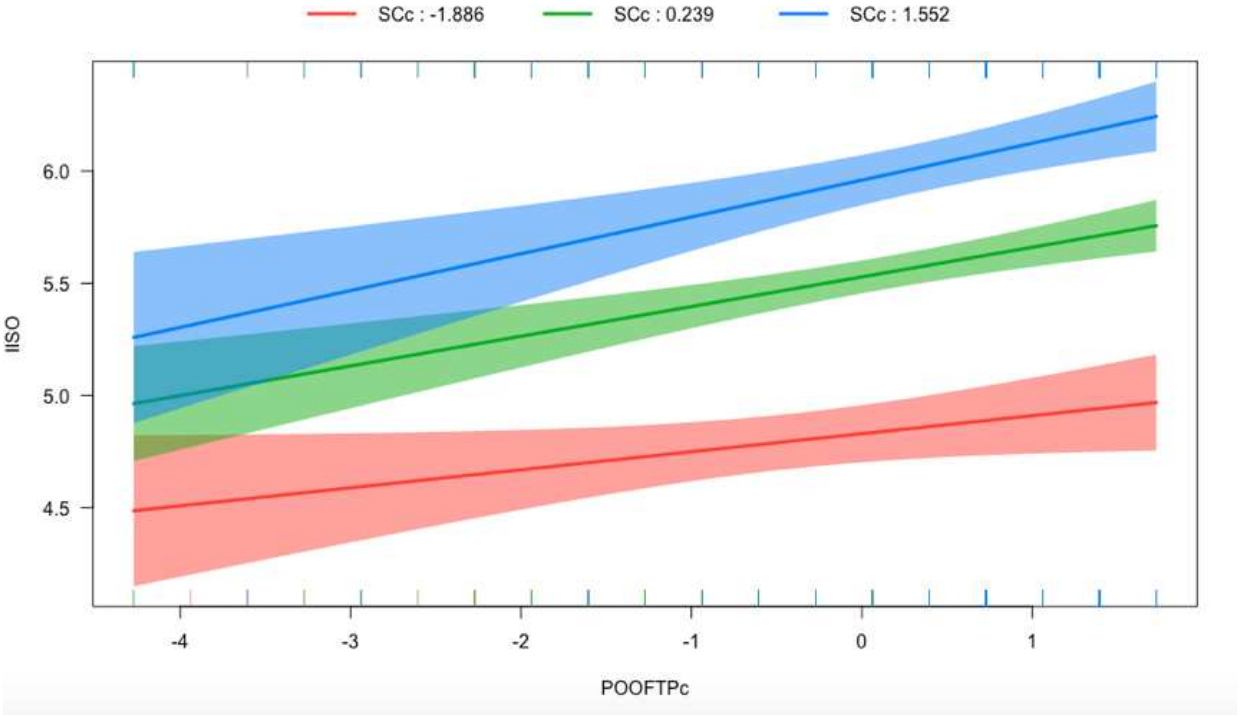
Supplementary Figures



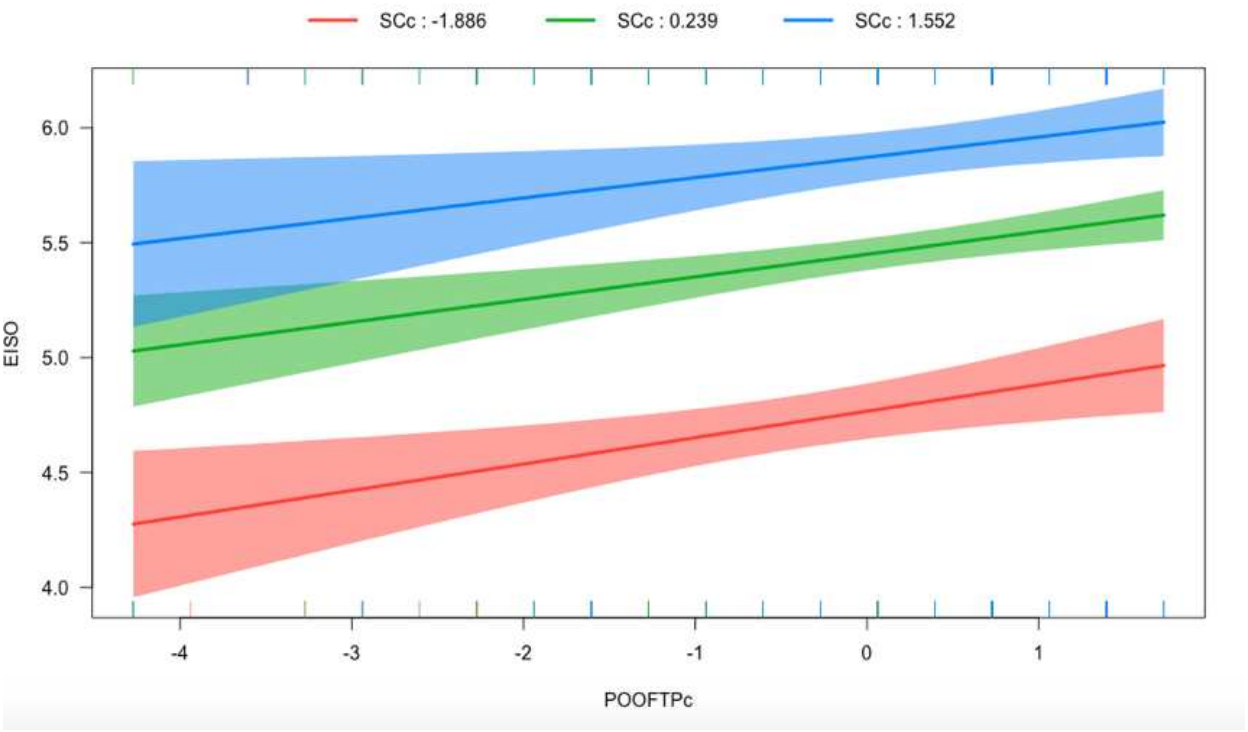
Supplemental Figure 1. Interaction plot: Safety climate and PO-OFTP with intrinsic valence of safety outcomes. (*Note*. SCc = safety climate, mean centered; POOFTPc = perceived opportunities OFTP, mean centered).



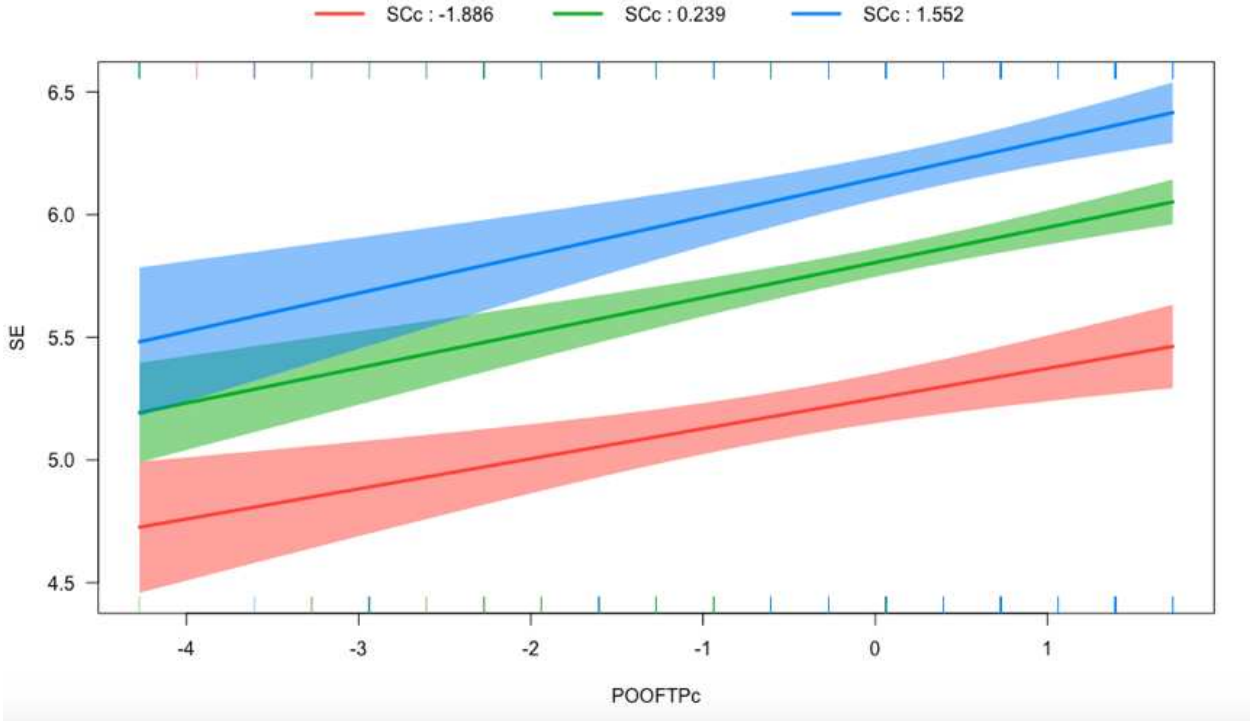
Supplemental Figure 2. Interaction plot: Safety climate and PO-OFTP with extrinsic valence of safety outcomes. (*Note*. SCc = safety climate, mean centered; POOFTPc = perceived opportunities OFTP, mean centered).



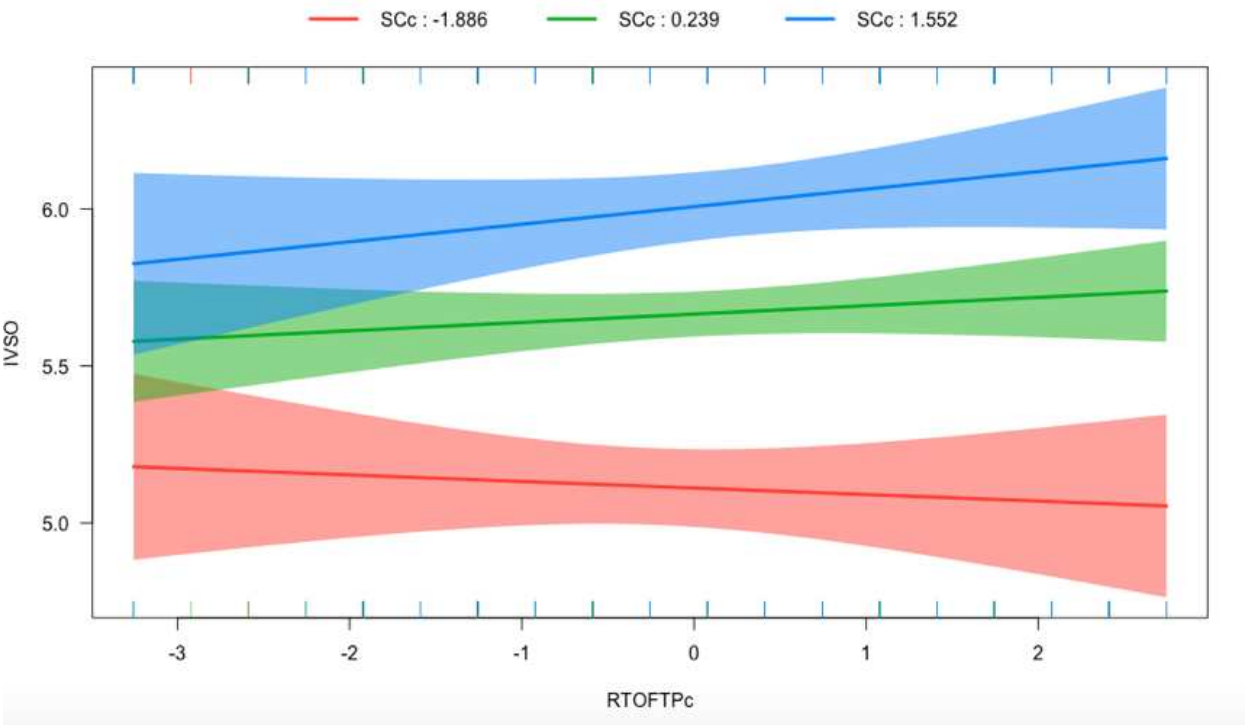
Supplemental Figure 3. Interaction plot: Safety climate and PO-OFTP with intrinsic instrumentality of safety outcomes. (*Note*. SCc = safety climate, mean centered; POOFTPc = perceived opportunities OFTP, mean centered).



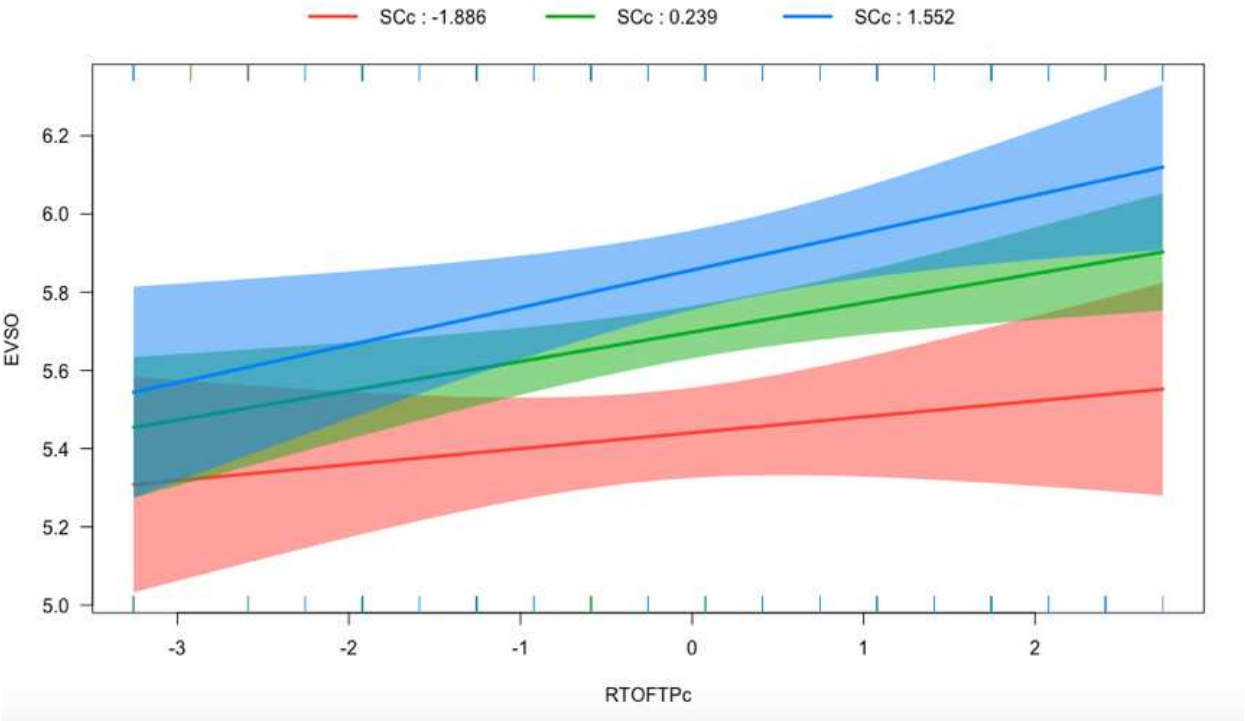
Supplemental Figure 4. Interaction plot: Safety climate and PO-OFTP with extrinsic instrumentality of safety outcomes. (*Note*. SCc = safety climate, mean centered; POOFTPc = perceived opportunities OFTP, mean centered).



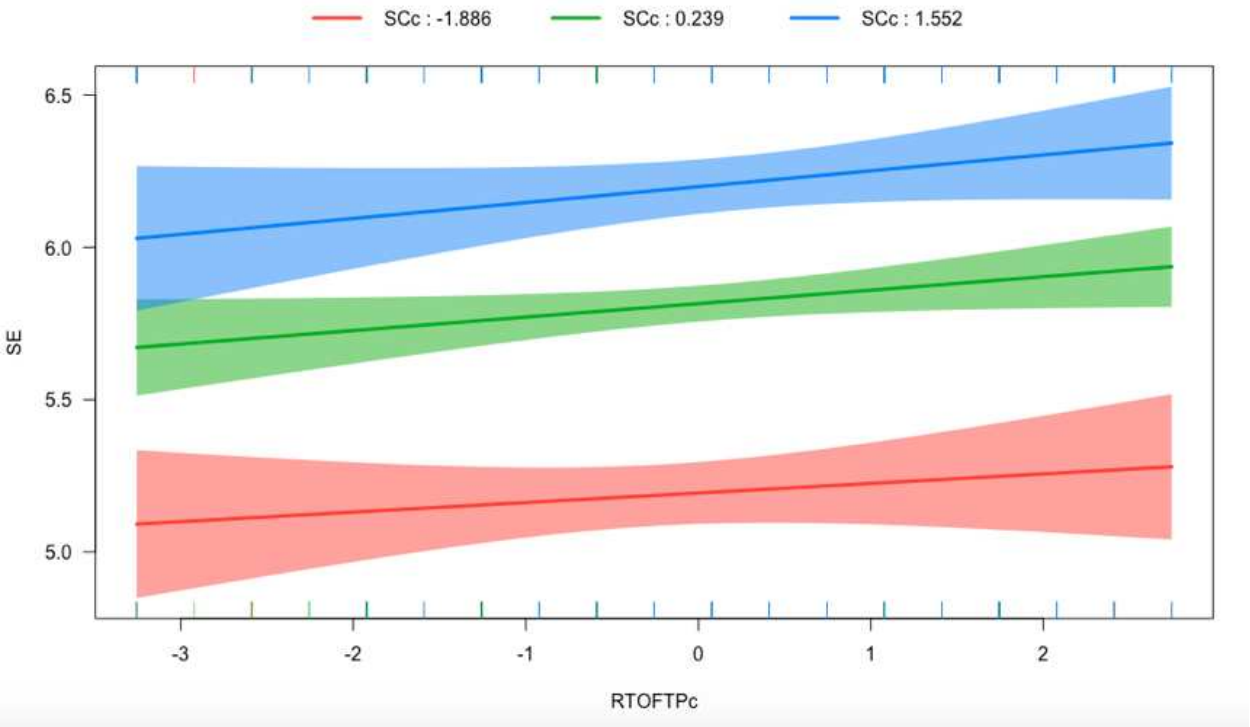
Supplemental Figure 5. Interaction plot: Safety climate and PO-OFTP with safety expectancy. (*Note*. SCc = safety climate, mean centered; POOFTPc = perceived opportunities OFTP, mean centered).



Supplemental Figure 6. Interaction plot: Safety climate and RT-OFTP with intrinsic valence of safety outcomes. (*Note*. SCc = safety climate, mean centered; RTOFTPc = remaining time OFTP, mean centered).



Supplemental Figure 7. Interaction plot: Safety climate and RT-OFTP with extrinsic valence of safety outcomes. (*Note*. SCc = safety climate, mean centered; RTOFTPc = remaining time OFTP, mean centered).



Supplemental Figure 8. Interaction plot: Safety climate and RT-OFTP with safety expectancy. (*Note*. SCc = safety climate, mean centered; RTOFTPc = remaining time OFTP, mean centered).