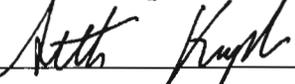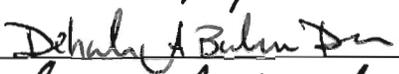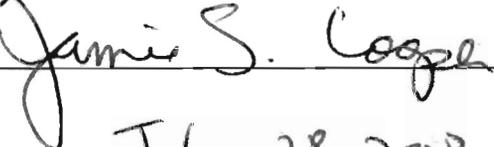# IMPLICATIONS OF PSYCHOLOGICAL DISTANCE FOR THE STRUCTURE AND MOTIVATION OF SAFETY AT WORK

by

Michael Thomas Ford
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Psychology

Committee:

_____ Director

_____

_____

_____ Department Chairperson

_____ Program Director

_____ Dean, College of Humanities
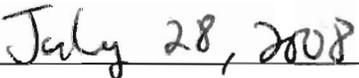and Social Sciences

Date: _____ Summer Semester 2008
George Mason University
Fairfax, VA

Implications of Psychological Distance for the Structure and Motivation of Safety at Work

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

By

Michael Thomas Ford
Master of Arts
George Mason University, 2004
Bachelor of Arts
Hamilton College, 2002

Director: Lois E. Tetrick, Professor
Department of Psychology

Summer Semester 2008
George Mason University
Fairfax, VA

DEDICATION

The work is dedicated to the health, safety, and well-being of workers and their families.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

IMPLICATIONS OF PSYCHOLOGICAL DISTANCE FOR THE STRUCTURE AND
MOTIVATION OF SAFETY AT WORK

Michael Thomas Ford, PH.D.

George Mason University, 2008

Dissertation Director: Dr. Lois E. Tetrick

Workplace safety behaviors can focus on present or future safety outcomes. They can

also focus on one's own safety or the safety of others and the overall worksite. These

outcomes vary in their psychological distance, or more specifically their temporal and

social distance. This distance has implications for how people construe, value, and focus

on future events. In this study, ratings from 13 safety researchers were used to

distinguish safety behaviors in the temporal and social distance of their outcomes. To

identify distinct correlates of safety behaviors with psychologically distant outcomes,

data were then collected from 198 hospital employees. Results suggest that

psychological empowerment, management commitment to safety, and organizational

identification are more strongly related to behaviors focused on the safety of others than

those focused on one's own safety. When all predictors were included in one model,

psychological empowerment was the strongest correlate of safety behaviors with

psychologically distant outcomes. Empowerment and organizational identification were also related to injury/illness rates at the department level. These results indicate that theories on workplace safety behavior can be enhanced by incorporating distinctions across behaviors. They also highlight the importance of empowerment and shared responsibility in safety-related industrial settings.

Introduction

Despite safety engineering advances, workplace accidents, injuries, and illnesses continue to be a significant problem in organizations today. In the United States in 2005, 4.2 million workers suffered nonfatal injuries at work and approximately 5,700 died due to fatal work-related injuries (Bureau of Labor Statistics, 2007). These accidents usually involve human errors, with these errors typically being a symptom of procedural and systemic failures at the worksite or organizational level (Reason, 1990). Employees can help prevent these systemic errors through participative, proactive, and collectively focused safety behaviors that have a broad work unit and/or worksite impact. Examples of these behaviors include making suggestions about how to improve safety procedures, keeping one's safety-related knowledge up to date, and helping coworkers learn to perform safely.

It is expected that these behaviors are more common among an empowered workforce that identifies with worksite outcomes. Empowerment based approaches to health and safety have received greater attention in industry over the past two decades. In ones study looking at several different industries, nearly half of the participants in an empowerment-based safety training program reported they or a coworker had raised a health and safety concern in response to the training and over half of those participants reported that a change had been made in response to the concern raised (Lippin, 2000).

One nuclear facility worker in the study reported that after the training, workers participated in a hazard analysis and started using a complete breathing apparatus while bulking acids, something that had not previously occurred to them. Hence, there is evidence that these behaviors can have a strong positive impact on safety.

Some of the motives and states predictive of these participative, proactive, and collective safety behaviors may be distinct from those for self-protective safety behaviors. Relative to self-protective behaviors, participative, proactive, and collectively focused safety behaviors entail a more distal psychological focus, a more active work role orientation, a greater identification with collective safety outcomes as well as individual ones, and a stronger focus on changing and improving the situation in addition to avoiding mistakes and other negative events. Despite these differences, most research on workplace safety motivation has focused on safety behavior as one factor, and exceptions to this (e.g., Burke, Sarpy, Tesluk, & Smith-Crowe, 2002; Hofmann, Morgeson, & Gerras, 2003) have provided valuable, but limited distinctions among behaviors. In order to understand the motivational bases for occupational safety behavior, a framework for understanding the structure of safety behaviors is needed that takes these distinctions across behaviors into account. The focus of this research is on identifying distinct situational, dispositional, and psychological state-based correlates of these participative safety behaviors at work.

The literature on self-regulation and motivation suggests that most behavior, including safety-related behavior, is purposeful and guided by future states such as goals and expected outcomes (e.g., Bandura, 1986; Carver & Scheier, 1982). One way to

distinguish among safety behaviors is through the psychological distance of their intended outcomes from the behavioral operant. Kurt Lewin (1951), in his attempt to develop a unifying field theory, made the first widely cited reference to psychological distance; according to Lewin, psychological distance refers a location in one's "life space." Two factors that contribute to psychological distance are temporal and social distance. Safety-related outcomes are more psychologically distant when they are temporally delayed and when they impact others than when they are immediate and impact oneself. Work safety behaviors vary considerably in the temporal and social distance of their intended safety outcomes. This variance in psychological distance may have implications for the motivational bases for these behaviors. Evidence suggests that individuals identify, construe, and value actions and their outcomes differently when they are psychologically distant (e.g., Steel & Konig, 2006; Trope & Liberman, 2003). This may influence how individuals regulate their behavior relative to safety-related goals.

This study identifies motives that are uniquely important for safety-related behaviors with psychologically distant outcomes. The case is made for these distinct motives by first analyzing the structure of safety performance. This is followed by a discussion of how psychologically distant events are construed, the role of extrinsic management reinforcement in participative behaviors, and the importance of a promotion regulatory focus, psychological empowerment, and collective organizational identification for these behaviors. Finally, these factors and behaviors are linked to objective safety performance outcomes.

Safety Performance

Job performance has been defined as behavior on the job with an evaluative component (Motowidlo, Borman, & Schmit, 1997). Research on job performance has distinguished task and contextual performance (Borman & Motowidlo, 1993; Motowidlo & Van Scotter, 1994). Task performance refers to activities directly involved in the production and/or delivery of goods and services and activities that maintain the technical core. Contextual performance involves behavior that contributes to organizational effectiveness through its impact on the work environment. Recent research on contextual performance has also delved into two related constructs, organizational citizenship and voice behavior. Organizational citizenship behaviors (OCB) include actions that contribute to the effectiveness of coworkers and the organization as a whole (Organ, 1988; for a review, see Hoffman, Blair, Meriac, & Woehr, 2007). Voice behavior includes constructive change-oriented communication intended to improve the work situation (Van Dyne & LePine, 1998; LePine & Van Dyne, 2001a).

Despite the empirical research distinguishing different dimensions of job performance, most research on safety behavior at work has treated safety performance as one dimension encompassing a small set of behaviors that relate directly to the performance of core job tasks, such as risk-taking, engaging in behavior to protect oneself, and following safety rules (e.g., Komaki, Collins, & Penn, 1982; Komaki, Heinzmann, & Lawson, 1980). Still, predating most published behavioral safety research, Andriessen (1978) separated *carefulness* and *actions directed toward improving safety conditions*. Recently, empirical research has begun to address Andriessen's (1978)

distinction. *Safety compliance*, which refers to rule-following in core safety activities such as wearing personal protective equipment, has been shown to be distinct from *safety participation*, which refers to activities that enhance the safety context of the organization such as participating in voluntary safety activities (Burke et al., 2002; Griffin & Neal, 2000; Neal & Griffin, 2006). Correlations between compliance and participation were also similar to those observed between general task performance and OCBs (Hoffman et al., 2007), suggesting that safety performance is similar in structure to general performance in this respect.

Burke, Sarpy, Tesluk, and Smith-Crowe (2002) developed and empirically tested a slightly more differentiated structure for safety performance. Burke et al. proposed four dimensions: 1) using personal protective equipment, 2) engaging in work practices to reduce risk, 3) communicating health and safety information, and 4) exercising employee rights and responsibilities. These four dimensions roughly map on to the distinction between task and contextual performance (e.g., Borman & Motowidlo, 1993). The first two factors reflect general task performance with respect to safety whereas the second two dimensions encompass behaviors that go beyond one's work tasks and could be considered part of contextual performance.

In another study, Hofmann, Morgeson, and Gerras (2003) applied research on organizational citizenship behaviors (Van Dyne, Graham, & Dienesch, 1994; Van Dyne & LePine, 1998) to workplace safety performance. Hofmann et al. separated safety citizenship behaviors into six categories: helping, voice, stewardship, whistleblowing, civic virtue, and initiating safety-related change. These safety behaviors are similar to

the organizational citizenship and voice-related behaviors from the general job performance literature and are an addition to the behaviors identified in Burke et al.'s (2002) structure in that they cover attempts by individuals to improve the safety of the worksite and organization as a whole.

In summary, there has been a necessary expansion of the safety performance criterion domain in occupational safety research demonstrating that safety performance is multidimensional, although the literature integrating dimensions of safety performance beyond self-protection remains relatively small. The multidimensionality of safety performance suggests that the motivational bases for different types of safety behaviors are in part distinct and may be useful in further understanding their structure. Incorporating the psychological distance of outcomes may shed light on the motivational, or "will do," predictors of safety behavior and further explain the multidimensionality of safety performance.

Proposed Four-Dimensional Structure for Safety Performance

The temporal and social distance of behavioral goals may have implications for safety motivation. Temporal distance varies as some behaviors are intended to impact safety immediately whereas others are intended to impact safety in the future. These are labeled here as *present-focused* and *future-focused* behaviors, respectively. With respect to social distance, some behaviors are intended to impact one's own safety, whereas others are intended to impact the safety of others and the work environment as a whole. These are labeled here as *self-focused* and *other-focused*, respectively. Fully crossed, this two-dimensional structure results in four types of safety-related behaviors: those that

6

impact oneself immediately, those that impact oneself with delayed outcomes, those that

impact others immediately, and those that impact others with delayed outcomes. See

Table 1 for a layout of this proposed structure.

Table 1.

Four-Dimensional Structure for Safety Behaviors

	Self-Focus	Other-Focus
Future-Focus	• Becoming knowledgeable in work hazards and legal issues related to safety • Behaviors that prevent cumulative injury and health decrements	• Participating in health and safety committees • Behaviors that contribute to the shared responsibility for a safe working environment
Present-Focus	• Self-protective behaviors to prevent acute injuries • Safe performance of work tasks that do not impact others' safety	• Helping others perform work tasks safely • Safe performance of work tasks that impact others' safety

The temporal focus of safety behaviors can be roughly mapped on to current

safety performance distinctions. Many behaviors that compose the traditional safety

compliance dimension have outcomes that are relatively immediate. For example,

wearing protective gear is often instrumental to immediate outcomes such as avoiding

acute hazards. Other self-protective behaviors that prevent cumulative injuries or

illnesses, such as hearing loss or back ailments, are instead focused on future outcomes.

Behaviors that compose safety participation or safety citizenship as defined by Hofmann

et al. (2003) and Griffin and Neal (2000) are also often future-focused. For example,

participating in health and safety committees and reporting the existence of hazards to appropriate authorities usually are aimed at long-term improvement and may have little immediate safety-related reinforcement. Still, some safety citizenship behaviors are intended to improve safety immediately, such as helping a coworker perform tasks safely.

Social focus can also be roughly mapped on to current distinctions. Certain behaviors such as wearing protective equipment and avoiding risks are primarily self-focused. Other behaviors, such as participating in health and safety committees and informing coworkers when they are performing tasks unsafely, are intended to improve the safety of others and of the work environment as a whole. These behaviors have received little attention in the safety motivation literature. One exception to this general omission is the work of Geller and colleagues (e.g., 1996) who labeled these types of acts as "actively caring" behaviors.

Using this framework, behaviors with the most psychologically close outcomes are those that impact oneself immediately, whereas those that are the most psychologically distant are those that impact others and have delayed outcomes. This four-dimensional structure is a potential augmentation of the two-dimensional compliance-participation structure proposed in the literature. Results from a pilot study (see Appendix A) where safety researchers were surveyed on 45 behaviors from the safety performance literature suggest that safety behaviors can be reliably rated along the temporal and social distance dimensions.

In this paper three differences are proposed between psychologically close and distant behaviors that have implications for their motives. First, there is evidence that

8

psychologically distant events are construed in a more abstract and decontextualized manner and are identified more by their purpose than by their specifics. Second, psychologically distant outcomes are likely to have a lower intrinsic value than psychologically close outcomes. Finally, behaviors that aim to influence psychologically distant outcomes are related to empowerment, promotion focus, and organizational identification, all of which inspire employees to take an active role in improving themselves and their work environment. This is in contrast to safety behaviors focused on psychologically close outcomes, which are motivated by a desire to maintain stability and avoid harm to oneself. See Figure 1 for a framework of the hypotheses proposed here. This framework proposes dispositional goals and regulatory foci, along with environmental reinforcement in the form of management commitment to safety, are related to psychologically distant safety behaviors directly and indirectly through psychological states of psychological empowerment and organizational identification. These states and behaviors are in turn related to safety outcomes at the group level.

GOALS

- Health
- Safety
- Community

REINFORCEMENT FROM THE WORK ENVIRONMENT

- Management Commitment to Safety

CHRONIC WORK-SPECIFIC REGULATORY FOCUS

- Promotion Focus
- Prevention Focus

PSYCHOLOGICAL STATES

- Psychological Empowerment
- Organizational Identification

SAFETY BEHAVIORS

- Present, self-focused behaviors
- Future, self-focused behaviors
- Present, other-focused behaviors
- Future, other-focused behaviors

SAFETY OUTCOMES

- Illnesses
- Injuries

Figure 1. *Framework for Study Hypotheses*

Construal Level and Principle Goals

The first difference proposed here between psychologically close and psychologically distant safety outcomes is the level at which they are construed. Construal level theory (Trope & Liberman, 2003) provides a framework to understand these different mental representations. According to construal level theory, people develop models of events at different levels of abstraction. High level construals are abstract, simple, structured, decontextualized, and superordinate. Low level construals, in contrast, are complex, concrete, and context-specific. High level construals are characterized by a few general, prototypical features, while low-level construals are more detailed in their differentiation of categories and contingencies. Trope and Liberman (2003) describe this as analogous to viewing a picture from two different physical distances. At a far distance, you see a big picture as a whole, whereas at a closer distance you see its specific features. Actions can be identified at different levels of construal. Vallacher and Wegner's (1987) Action Identification Theory suggests that actions can be identified in terms of lower-order and/or higher-order goals. Lower-order goals refer to the specifics or the "how" of the actions, whereas higher-order goals refer to the purpose or the "why" of the actions (also see DeShon & Gillespie, 2005). For example, the action "conducting a study" would be considered as "advancing science" at a higher-level of construal or identification, whereas it would be seen as "testing hypotheses" at a lower level.

There is a growing body of research showing that individuals develop higher-level construals of distant events and lower-level construals of close events, and that

these construals impact action preferences. Decisions with respect to distal outcomes have been shown to be more related to higher-order personal goals, whereas those with respect to outcomes that are close are more motivated by temporary affective goals (e.g., increasing one's mood); these findings reflect that the value placed on high-level construals is more positively related to the attractiveness of future actions, whereas the value placed on lower-level construals is more positively related to the attractiveness of immediate actions (Trope & Liberman, 2000). For example, studying in the library, which has a stronger higher-order goal and purpose but less immediate specific outcomes, is seen as a more attractive option in the distant than the near future, whereas eating unhealthy food, which does not help one achieve higher-order goals but does achieve specific desires, is a more attractive option in the near than distant future. Fujita and colleagues (2006) found that high-level construals resulted in decreased preferences for immediate as opposed to delayed outcomes, suggesting that individuals have a higher level of self control under high-level construals. Furthermore, they showed that simply priming a high construal level increases the perceived value of temporally distant outcomes, whereas priming a low construal level increases the value of temporally near outcomes.

Given that distant events tend to be construed at a higher, more abstract level (Trope & Liberman, 2003), higher-order goals may be a stronger predictor of future-focused safety behaviors than present-focused behaviors. Higher-order goals influence behavior by guiding personal goals and are not specific to any situation. They specify the "why" of specific actions as opposed to lower-order goals, which specify the "how"

(Deshon & Gillespie, 2005). Individuals who engage in future-focused safety behaviors, according to construal level theory (Trope & Liberman, 2003), are more likely to represent future outcomes of their behavior in abstract terms guided by higher-order safety goals. These principle goals are not context-dependent; rather they cover different work behaviors. More broadly, future-oriented behaviors are identified by their purpose or "why" characteristics, whereas present-oriented behaviors are identified by their procedures, or "how" characteristics (Trope & Liberman, 2003). Hence, future-oriented safety behaviors are likely to be identified with principle goals that specify the purpose of behavior, whereas present-oriented safety behaviors are likely to be identified with short-term, lower-order goals and task-specific beliefs about how to avoid a specific hazard.

Safety and physical health are principle goals that may have implications for safety behaviors and future-oriented safety behaviors in particular. Safety and physical health goals reflect an importance placed on bodily integrity, safety, health, and the absence of illness (Grouzet et al., 2005). Grouzet et al. (2005) found that safety and physical goals were organized similarly across 15 cultures, suggesting that they are relatively universal in their structure while varying in importance across individuals and situations.

Safety and physical health goals are expected to motivate behaviors that enhance physical health and safety. The relationship between these goals and corresponding behavior may be stronger when the behavioral outcomes are construed at a higher, abstract level since, as noted by Trope and Liberman (2003), actions with outcomes at high construal levels tend to be more driven by their purpose than actions with outcomes

13

construed at a low level. These higher levels of construal are more likely for temporally distant outcomes (Trope & Liberman, 2003). Therefore future-focused safety behaviors may be more positively related to safety and physical health goals than present-focused safety behaviors, which have been shown to be predicted by more context-specific expectancies (e.g., Melamed et al., 1996).

H1a: Safety and physical health goals are positively related to the performance of all four types of safety behaviors.

H1b: The relationship between safety and physical health goals and the performance of future-focused safety behaviors (self and other-focused) is stronger than the relationship between safety and physical health goals and the performance of present-focused safety behaviors (self and other-focused).

Trope and Liberman (2003) and Bar-Anan, Liberman, and Trope (2006) suggest that principles of temporal construal may also apply to social distance. Social distance is distance from the social self and is increased as events or outcomes become more relevant for others than oneself. A long line of research has shown that people tend to attribute the behavior of others to dispositions while attributing their own behavior to the specifics of the situation (Heider, 1944; Jones, 1979; Robins, Spranca, Mendelsohn, 1996). People also tend to view out-groups as more homogenous and in more abstract terms while viewing in-groups as more differentiated and in more concrete terms (Park, Ryan, & Judd, 1992). In a study looking at the effects of power on information processing, Smith and Trope (2006) found that individuals who were primed by power situations were more likely to process information in an abstract manner and to identify

14

actions by their purpose rather than by their procedures. Those who were power-primed also demonstrated evidence of greater activation of the right hemisphere of the brain, which is associated with more global information processing. Smith and Trope interpreted these findings as evidence that power increased the psychological (primarily social) distance from the subject matter the participants were examining. Individuals therefore may be more likely to abstractly process and represent outcomes concerning coworkers than information about themselves because others are more psychologically distant.

Since other-focused safety behaviors have outcomes that are more psychologically distant, they may be more driven by goals than self-focused safety behaviors. As with future-focused behaviors, other-focused behaviors may have more uncertainty associated with their outcomes. Individuals may perceive themselves as having less control over how safety behaviors impact others than how they impact themselves. For example, one may not know if helping someone else perform tasks safely or voicing concerns to management about safety issues will impact the safety of others. In contrast, employees may be more confident in judgments about how protective gear impacts their personal safety. Therefore, in deciding when to engage in other-focused safety behaviors, individuals may hold more abstract representations of expected outcomes and draw from higher-order goals when deciding how to behave.

Community goals may be particularly important for other-focused behaviors. These goals reflect collectivist values and indicate a desire to improve the world through generativity. Schwartz and Bilsky (1987, p. 552), in attempting to develop a unified

structure of human values, noted that "a positive, active concern for the welfare of others is also necessary for collectivities to thrive." They found that these values differ across cultures along an individualist-collectivist dimension (Schwartz & Bilsky, 1990) and later reduced their overall value structure to two dimensions, one being collectivism-individualism. Grouzet and colleagues, through multidimensional scaling, found results across 15 cultures suggesting that community goals, like those for health and safety, are organized similarly by individuals throughout the world. It is hypothesized here that community goals predict the performance of other-focused safety behaviors because of the focus of these behaviors on improving the safety of others and the work group as a whole. In addition, since construal levels may be more abstract for other-focused than self-focused outcomes, community goals may be stronger predictors of other-focused than self-focused behaviors.

> H2a: Community goals are positively related to the performance of other-focused safety behaviors (present and future-focused).
>
> H2b: Community goals are more positively related to the performance of other-focused than self-focused safety behaviors (present and future-focused).

Management Commitment to Safety

Psychologically distant outcomes may also have a lower intrinsic value than psychologically close outcomes. There is evidence that individuals place greater value on outcomes when they are more immediate than when they are temporally distant (Steel & Konig, 2006). It is also likely that individuals will tend to value self-relevant outcomes more than outcomes relevant for others. Given that the outcomes of future-

16

focused and other-focused behaviors may have less intrinsic value to the behavioral operant, reinforcement from others and extrinsic rewards that are attached to these behaviors may be increasingly important in the performance of these behaviors.

The impact of time on the representation of future events and the relative utility of competing choices has been discussed in the self-regulation and decision-making literature. The theory of hyperbolic discounting suggests that the value of outcomes decreases as they become more delayed (Loewenstein & Elster, 1992). Temporal Motivation Theory (TMT), proposed by Steel and Konig (2006), integrates hyperbolic discounting theory with expectancy theory. According to TMT, expected utility is a function of the product of valence and instrumentality, as specified in expectancy theory (Vroom, 1964), but then must be divided by the difference between the current time and the time that the outcome is expected. As a result, the forces that impact behavior according to expectancy theory, particularly efficacy and instrumentality, are attenuated by the temporal distance from the expected outcome, which decreases the outcome's intrinsic value.

The discounting of delayed outcomes, which has been used to explain a variety of maladaptive behaviors such as smoking (Reynolds et al., 2007), impulsive cocaine use (Coffey, Gudleski, Saladin, & Brady, 2003), failure to save for retirement (O'Donoghue & Rabin, 1999), and general procrastination (Steel, 2007) may be useful for understanding motivation for the performance of future-focused safety behaviors. When people underweight the value of future outcomes relative to those that are immediate, they may engage in impulsive behavior with short-term gains while neglecting behaviors

17

that have delayed benefits. Given that future safety outcomes may be perceived as less desirable and important than immediate safety outcomes, the outcomes associated with future-focused safety behaviors may have less expected utility than those associated with present-oriented actions. In other words, the reinforcement value of future safety outcomes from the task itself is likely to be lower than the reinforcement value for immediate safety outcomes.

If future-focused behaviors are by default seen as less likely to result in their intended safety outcomes and those outcomes are less valued due to their temporal distance, alternative reinforcers may be more important for future-focused safety behaviors than for present-focused behaviors. The most researched and arguably strongest extrinsic reinforcement is that which comes from management. Management commitment to safety is the primary factor in safety climate research (Zohar, 1980) and has been shown to have consistently significant effects on safety behavior and outcomes (Clarke, 2006). Therefore, management commitment to safety may play a greater role in the performance of these behaviors which have temporally distant outcomes and by default a lower intrinsic value. Management commitment can attach immediate nonsafety outcomes (e.g., management approval) to future-focused behaviors which have few if any immediate safety outcomes. For example, managers can give praise to employees who perform safely and show disapproval of unsafe practices. They can also reward behaviors that take away from safety, such as the speeding up of work practices.

Following this line of reasoning, perceptions of management commitment to safety may be a stronger predictor of future-focused than present-focused safety

behaviors. Present-focused behaviors have more salient and valued safety outcomes, which increases the safety-specific motives for these behaviors. For example, the safety-driven motivation for wearing protective eye goggles (a present-focused behavior) is likely to be greater on average than the safety-driven motivation for participating in health and safety committees (a future-focused behavior), since the outcomes of the former are by default more highly valued than those of the latter, according to theories on delayed discounting. This is not to say there is no safety-related motivation for future-oriented behaviors, but rather to say that alternative reinforcers, particularly management commitment to safety, are more important in the performance of future-oriented than present-oriented behaviors.

Whereas the difference in the value of expected outcomes of future-focused relative to present-focused behaviors is explained by hyperbolic discounting of future outcomes, other-focused safety behaviors are also likely in general to have lower value than self-focused safety behaviors. This is based on the fundamental notion that individuals are first driven by their own safety needs and secondarily by the need to keep others safe. Hence, it is expected that perceptions of management commitment to safety have a similar impact on other-focused behaviors as on future-focused behaviors. They serve as an alternative reinforcer with a stronger effect on behaviors that have psychologically distant and less valued outcomes.

In summary, it is expected that behaviors with psychologically distant outcomes, either future-focused or other-focused (or both), are more strongly related to perceptions

of management commitment to safety than behaviors with the least amount of

psychological distance associated with them (i.e., present/self-focused).

H3a: Perceptions of management commitment to safety are positively related to

the performance of all four types of safety behaviors.

H3b: The relationship between perceptions of management commitment to safety

and the performance of future/self-focused, future/other-focused, and

present/other-focused behaviors is stronger than the relationship between

perceptions of management commitment to safety and the performance of

present/self-focused behaviors.

Psychological Empowerment

Psychological empowerment is a psychological state that may have a greater

influence on psychologically distant safety behaviors than psychologically close safety

behaviors. Spreitzer (1995) defined psychological empowerment as a motivational

variable manifested in four cognitions that had been established in previous research:

meaning, competence, self-determination, and impact. Meaning refers to the value of a

work goal or purpose (Thomas & Velthouse, 1990). Competence is one's belief in one's

own ability to perform activities and is synonymous with self-efficacy (Bandura, 1982) in

the work context, except that it is generalized and not task-specific. Self-determination is

one's belief that one has a choice to initiate one's own actions (Deci, Connell, & Ryan,

1989). Impact is the extent to which a person can impact strategic, administrative, or

operating outcomes at work (Ashforth, 1989). These characteristics reflect an active

work role orientation such that employees perceive they are able to shape their work

20

context. Spreitzer (1995) found that empowerment, as a single higher-order factor composed of the 4 separate lower-order factors, was significantly related to innovation and managerial effectiveness.

Research has found that psychological empowerment is related to several work-related criteria. These include innovation (Spreitzer, 1995), organizational citizenship behaviors and creativity (Alge, Ballinger, Tangirala, & Oakley, 2006), organizational commitment (Avolio, Zhu, & Koh, 2004), and job satisfaction (Laschinger, Finegan, Shamian, & Wilk, 2004). Psychological empowerment has also been found to be related to change-oriented leadership behavior (Spreitzer, de Janasz, & Quinn, 1999).

There has not been much research looking at psychological empowerment with respect to safety, perhaps because most safety motivation research has focused on present- and self-focused behaviors. One study conducted by Mullen (2005) looked at the willingness of employees to raise safety issues and found that those with perceptions of "top management openness" were more likely to perceive that top management would pay attention to a safety issue and in turn were more willing to invest time, energy, and effort in identifying safety issues. Hofmann and colleagues (2003) found that the quality of one's leader-member exchange relationship was positively related to safety citizenship behaviors only when there was a strong positive safety climate. However, inferences with respect to empowerment and safety are primarily rational and not empirically based at this point.

Those who see themselves as having power within the organization and believe in their ability to initiate safety-related changes (i.e., psychological empowerment) may be

more likely to engage in future-focused and other-focused behaviors. These individuals will be more likely to perceive their behavior as instrumental to group- and organization-level change with respect to safety hazards and procedures. In contrast, psychological empowerment may not be as crucial for behaviors that are self- and immediate-focused, since the outcomes of these safety behaviors (e.g., accident avoidance) do not typically involve significantly changing the work safety environment. Psychological empowerment might also increase the likelihood of future-focused behaviors by facilitating the perception that the outcomes of those behaviors are not as temporally distant. A decrease in outcome delay tends to increase motivation due to the increasing utility of temporally close outcomes (Loewenstein & Elster, 1992). Psychologically empowered employees may view their organization as more ready for positive change and believe that they have a direct influence on safety policies and practices; they may therefore see their behaviors are more instrumental to delayed outcomes.

> H4a: Psychological empowerment is positively related to the performance of self/future-focused, other/future-focused, and other/present-focused safety behaviors.

> H4b: Psychological empowerment is more positively related to the performance of self/future-focused, other/future-focused, and other/present focused safety behaviors than to the performance of immediate/self-focused safety behaviors.

Psychological empowerment is a state that is likely to arise out of perceived management commitment to safety and may explain at least part of the relation between management commitment to safety and future-focused behaviors. By showing a

commitment to safety, management places a priority on the well-being of the employee.

This is likely to result in a greater congruence between the requirements of one's work

role and the employee's own beliefs and values, assuming they value their own safety.

Congruence between one's work role and one's beliefs, values, and behavior has been

said to characterize work role meaningfulness (Brief & Nord, 1990), one of the

characteristics of empowerment (Spreitzer, 1995). Furthermore, by having managers that

are committed to their safety, employees may be motivated to take a more active role in

their work environment in order to reciprocate this commitment. When safety is given a

priority, employees may see their interests as important to the organization and therefore

perceive themselves to have a greater impact on the administrative, strategic, and

procedural operating outcomes at work. The perception of the impact one has on the

organization is also a key part of employee psychological empowerment (Spreitzer,

1995).

Employees who perceive management as committed to safety may also develop

clearer role definitions about safety (Hofmann, Morgeson, & Gerras, 2003) and perceive

greater clarity in their manager's behavior and priorities (Zohar & Luria, 2004). These

situations may create clearer expectations of employees and reduce their role ambiguity.

Role ambiguity has been found to be negatively related to psychological empowerment

(Spreitzer, 1996). Management commitment may also be interpreted as support from

management, creating a sense of individual competence (Spreitzer, 1996) and breaking

down barriers to future- and other-focused safety behaviors by creating an environment

where employees feel capable of taking control of the future safety of their work

23

environment. Perceptions of management commitment to safety and employee empowerment are hypothesized as key components in making these psychologically distant behaviors more desirable and likely among employees.

> H5: Psychological empowerment mediates the relation between perceived management commitment to safety and the performance of self/future-focused, other/present-focused, and other/future-focused safety performance.

Regulatory Focus

Promotion and prevention regulatory foci reflect distinct psychological states and/or chronic tendencies that may also be distinct in the prediction of safety behaviors with psychologically distant outcomes. Regulatory focus theory proposes that individuals vary in the extent to which they focus on promotion and prevention goals (Higgins, 1997). Needs and goals involving security, safety, and stability are more important under a prevention focus, whereas needs involving gains and progress are more important under a promotion focus. This can be induced temporarily by the situation and also be a part of a chronic tendency or disposition. This study focuses on chronic regulatory focus in the work domain.

Higgins' (1997) regulatory focus theory has several implications for how individuals consider the utility of potential outcomes. Prevention focus results in a greater sensitivity than promotion focus to punishments, particularly those that threaten one's security and evoke pain (Higgins, 1997). Those in a promotion focus are more sensitive to rewards and achievement-related goals (Higgins, 1997). Goals that are the subject of one's attention may be the most likely to result in the mobilization of directed

effort. Regulatory focus impacts the extent to which individuals notice and act on goal-feedback discrepancies. This might result in a tendency to act on avoidance goal discrepancies such as risk and safety if one is in a prevention focus, and a tendency to act on achievement and progress goal discrepancies, such as performance, if one is in a promotion focus. Supporting this distinction in a series of lab studies, Forster, Higgins, and Bianco (2003) found that individuals in a promotion focus completed tasks more quickly, whereas those in a prevention focus were more accurate. Those in a promotion focus also show a risky bias to their decisions (Crowe & Higgins, 1997). These results suggest that individuals in a promotion focus are more driven to increase productivity, an achievement goal, whereas those in a prevention focus are more motivated to avoid errors and risks, which are goals of avoidance.

Regulatory focus has also been shown to impact the weight placed on the affective reactions that individuals experience. Those in a promotion focus are more motivated by an action's outcomes with respect to satisfaction and excitement and the absence of dejection. In contrast, those in a prevention focus are more motivated by anticipated outcomes of relief and contentment and the absence of agitation and anxiety (Leone, Perugini, & Bagozzi, 2005). In a similar vein, regulatory focus influences the value placed on anticipated emotions (Higgins, Shah, & Friedman, 1997). Those in a promotion focus are more prone to emotions of cheerfulness or dejection, based on performance with respect to approach-oriented goals. In contrast, those in a prevention focus are more likely to experience emotions of quiescence or agitation. These are primarily based on outcomes with respect to goals of avoidance.

25

Recently, regulatory focus has been applied to occupational safety contexts. Wallace and Chen (2006) applied regulatory focus theory to workplace safety in a study of university facility employees and found that group-level safety climate was negatively related to promotion focus and positively related to prevention focus. Furthermore, promotion focus was positively related to productivity and negatively related to safety performance, whereas prevention focus was negatively related to productivity and positively related to safety performance. Wallace (in press) also looked at the effect of regulatory focus in a laboratory task and found that regulatory focus was related to the emphasis placed on safety and production in a similar pattern. These studies suggest that prevention focus increases safety behavior and promotion focus decreases it.

This valuable program of research, however, has focused primarily on the performance of present- and self-focused safety behaviors, particularly behaviors where individuals manage and avoid risk with their immediate environment. Regulatory focus has not been applied to behaviors where individuals attempt to change the safety context of the work environment for others and in the future. Present-focused behaviors are often primarily concerned with the avoidance of immediate negative outcomes. In contrast, future-focused and other-focused safety behaviors, while concerned with the avoidance of accidents, are also focused on improving future working conditions and procedures and increasing the quality of the work environment. Future- and other-focused safety behaviors are also less likely to be specified as part of one's task requirements. It has been shown that there is considerable variability in the role definition of safety

26

citizenship behaviors (Hofmann, Morgeson, & Gerras, 2003). These behaviors often have psychologically distant outcomes.

An individual's chronic or habitual tendency towards focusing on prevention and promotion goals at work may have differential relations with the performance of psychologically close and distant safety behaviors. Given that psychologically distant safety behaviors are not as likely to be part of one's formal role obligations and are motivated by improvement toward more ideal conditions, these behaviors may be driven by ideals, such as a hazard-free workplace, to a greater degree than by obligations, such as rule-following behavior. According to regulatory focus theory (Higgins, 1997) promotion focus is associated with approach as a strategic means and the achievement of desired states. Psychologically distant safety performance may be the result of a strategic orientation towards improving oneself and the workplace and, in a broader sense, achieving a better state. In contrast, psychologically close safety performance may be more likely to arise out of a strategic orientation towards avoiding unwanted outcomes and maintaining stability.

While the case can be made that future- and other-focused safety is increased with a promotion regulatory focus, it is also motivated to a certain extent by accident avoidance, which reflects an avoidant orientation and a prevention focus, as noted above. Hence, it may be that future- and other-focused safety performance are positively related to both promotion *and* prevention regulatory foci, whereas present- and self-focused safety performance are only positively related to prevention focus. Such a pattern of findings is plausible given that prevention and promotion foci are conceptually and

empirically distinct (Higgins, 1997; Lockwood, Jordan, & Kunda, 2002; Wallace et al., 2005; Wallace & Chen, 2006). This leads to the following hypotheses with respect to regulatory focus:

H6: Chronic work-specific prevention focus is positively related to the performance of all four types of safety behaviors.

H7: Chronic work-specific promotion focus is more positively related to self/future, other/present, and other/future-focused behaviors than to self/present behaviors.

Organizational Identification. The final psychological state that may play a stronger positive role in psychologically distant, particularly other-focused, safety behaviors is organizational identification. First, organizational identification reduces the social distance of the expected outcomes of other-focused safety behaviors and in turn increases their intrinsic value, making those behaviors more preferred. Ashforth and Mael (1989) stated that "identification is the perception of oneness with or belongingness to a group, involving direct or vicarious experiences of its successes and failures (p. 34)." This social identification occurs when individuals see themselves as representative of their group and perceive group characteristics as self descriptive (Ellemers et al., 2004). Individuals who identify with their work organization will likely place a greater value on organizational outcomes (e.g., safety of the work environment) than those low in organizational identification and therefore be more likely to perform behaviors that increase those organizational outcomes.

A second, broader argument for the importance of organizational identification in the motivation of other-focused safety behaviors is that individuals largely share with others the responsibility for keeping coworkers safe. Hence, the responsibility for performing behaviors with outcomes that influence others, particularly with respect to maintaining and enhancing a safe work environment, is often shared. The safety of the work environment is typically achieved through the joint contributions of several employees rather than behavior of a single individual. This has been noted in industry, such as in a guest editorial in the *Journal of Advanced Nursing*, where the executive director of the Canadian Nurses Association, Lucille Auffrey (2005, p. 563), stated, "Patient safety is a shared responsibility. System accountability requires that all members of the health care team work collaboratively to identify and manage problems in the system."

One of the primary ways in which shared responsibilities differ from individual responsibilities is in the extent to which individuals are motivated to fulfill responsibilities when others can also fulfill them. The decrease in effort when individuals are working as part of a group relative to when working alone is labeled *social loafing* (Latane, Williams, & Harkins, 1979). Social loafing has been the subject of a considerable body of research, some of which is summarized in Karau and Williams' (1993) meta-analysis. There have been several reasons proposed for the motivation loss that individuals experience in groups, including reduced social impact (Latane, 1981), inability to identify individual input (Williams, Harkins, & Latane, 1981), and perceived dispensability of one's effort (Kerr, 1983).

An approach based on expectancy theory that has been used to explain group motivation loss is Karau and Williams' (1993) Collective Effort Model (CEM), which applies Vroom's (1964) expectancy theory to motivation in group and shared effort situations. The CEM proposes that individuals exert effort on a collective task to the extent that they believe their effort is instrumental in obtaining valued outcomes. Motivation toward group outcomes is a function of the behavior's instrumentality toward group performance and the value of group performance for the individual. Behaviors that contribute to the safety of the overall work environment such as initiating safety-related change, participating in health and safety committees, and helping coworkers perform task procedures more safely are aimed at group-level safety outcomes and can usually be performed by several different people on a worksite, lessening the instrumentality and identity of one's individual input.

Applications of theories of group motivation loss to workplace safety have been rare, but there are a few examples. Benevento (1998) discussed the relevance of social loafing to safety. Henriksen and Dayton (2006) noted that health care providers frequently miss components of patient care when responsibility for care is spread out among group members. Gopher and colleagues (2000) showed that in signal detection tasks individuals relax their vigilance when they share the responsibility for detecting hazardous signals with others. Outside of these studies, social loafing factors have not been researched in the psychological literature with respect to safety performance.

Given the proposed role of group motivation loss in contextual safety performance, factors that mitigate the effects of social loafing in general may also

mitigate their impact on other-focused behaviors, most of which involve shared responsibilities. One moderator of social loafing effects is the extent to which individuals identify with other group members. In Karau and Williams' (1993) meta-analysis, they found that when individuals were working with friends as teammates, or were put in a situation to foster cohesiveness, social loafing effects were eliminated. This suggests that when individuals identify with other work organizational members or the organization as a whole they are less likely to exhibit social loafing. Cohesion in general also has been shown to attenuate social loafing (Karau & Hart, 1998). Similarly, others have proposed that social identification and collective identity plays an important role in motivation in work groups (Ellemers, Gilder, & Haslam, 2004). Individuals with a strong interpersonal and collective identity have common bonds with other group members and share a symbolic group membership. When these identities are activated, individuals are more likely to act in the benefit of others and for the collective welfare of the group (Brewer & Gardner, 1996). Hogg and Terry (2000) proposed that such motives are particularly applicable to organizations where individuals act on a group's behalf. These perspectives all suggest that group and collective identification increases motivation towards group goals and results.

In the context of safety, it would be expected that behaviors that are other-focused, which can usually be fulfilled by one of several employees and have safety benefits at the workgroup or worksite level, are more likely to occur when individuals identify themselves with their organization. Those with a high level of organizational identification may place a greater value on organizational outcomes, diminishing the

impact of group motivation loss on other-focused safety behaviors and reducing or minimizing the impact of social distance on the intrinsic value of outcomes that impact others and the organization as a whole. In contrast, the factors identified in theories of group motivation loss, including organizational identification, would not be expected to play a significant role in self-focused behaviors

> H8a: Organizational identification is positively related to the performance of other-focused behaviors (present and future-focused).

> H8b: Organizational identification is more strongly positively related to the performance of other-focused safety behaviors (present and future-focused) than self-focused safety behaviors (present and future-focused).

Organizational identification may partially explain the link between community goals and other-focused behaviors. Community goals reflect guiding principles that would likely draw one to identify with and act for the benefit of others and society as a whole (Grouzet, 2005; Kasser & Ryan, 1993). Given that individuals with community and affiliation goals are likely to identify and empathize with the outcomes of others, including coworkers, it is expected that they are more likely to identify with their organization. Hence, organizational identification is hypothesized to partially mediate the relationship between community goals and the performance of other-focused safety behaviors.

> H9: Organizational identification partially mediates the relationship between community goals and the performance of other-focused safety behaviors (present and future-focused).

Safety Outcomes

Typical safety performance models (e.g., Zohar, 2003) suggest that aspects of the work environment impact cognitions such as goals or behavior-outcome expectancies, which in turn impact behavior. This behavior ultimately impacts accident and injury rates. Studies of behavioral interventions (e.g., Komaki et al., 1980) have shown that modifying behavior can in turn reduce accident rates. Behavior at the individual level may impact injury rates at the unit level, particularly when those behaviors are focused on the safety of others. For example, helping coworkers perform work safely impacts a coworkers' likelihood of having an accident or injury. Suggesting ways to improve procedures to make them safer may reduce the likelihood of any coworker experiencing injuries. Neal and Griffin (2006) found that self-reported safety behavior predicted subsequent accident rates at the unit level. As they noted (p. 947), "noncompliance with safety procedures and refusal to participate in activities that enhance the safety of other people, therefore, may not directly affect the person who fails to carry out these behaviors, but can create the conditions that make it more likely that someone else will be injured later on." Here, it is expected that other-focused behaviors are negatively related to injuries experienced at the work unit level.

> H10: Other-focused safety behaviors are negatively related to injury rates at the unit level.

In addition to other-focused safety behaviors, it is expected that work units with high levels of empowerment and organizational identification have lower injury rates. Individuals in an empowered state perceive that they have an impact on their worksite

and take an active role in their work environment. Work groups with these types of

individuals are likely to have people who are proactive and take action to prevent

accidents and injuries. Those with a high organizational identification would be expected

to take action towards group outcomes, which in turn would be expected to prevent

accidents at the unit level. Work groups that are empowered and have high levels of

group identity may be more likely to eliminate or reduce systemic vulnerabilities that

increase the likelihood of injuries (Reason, 1990).

> H11: Empowerment and organizational identification are negatively related to
>
> injury rates at the unit level.

Similar to other studies looking at management commitment to safety (e.g., Neal

& Griffin, 2006), it is also expected here that work units that report high levels of

management commitment to safety experience fewer injuries. These units are likely to be

reinforced for future-focused and other-focused behaviors and therefore may be more

likely to engage in these actions that help fulfill collective and proactive safety goals.

> H12: Perceptions of management commitment to safety are related to injury rates
>
> at the unit level.

Research on safety motivation to this point has primarily focused on behaviors

with psychologically close outcomes. In this research, I have proposed that some of the

motivational bases for safety behaviors with psychologically distant outcomes differ from

those for psychologically near outcomes because they are 1) construed differently, 2)

have different levels of intrinsic value, and 3) are driven by different psychological states.

These hypotheses are summarized in Figure 2.

Safety and Physical Health Goals

Prevention Focus

Promotion Focus

Perceptions of Management Commitment to Safety

Psychological Empowerment

Community Goals

Org Identification

Self-Present Behavior

Self-Future Behavior

Other-Present Behavior

Other-Future Behavior

Safety Outcomes

H2a&b

H7

H8

H4a&b

H6

H5a&b

H10

H9a&b

H3a&b
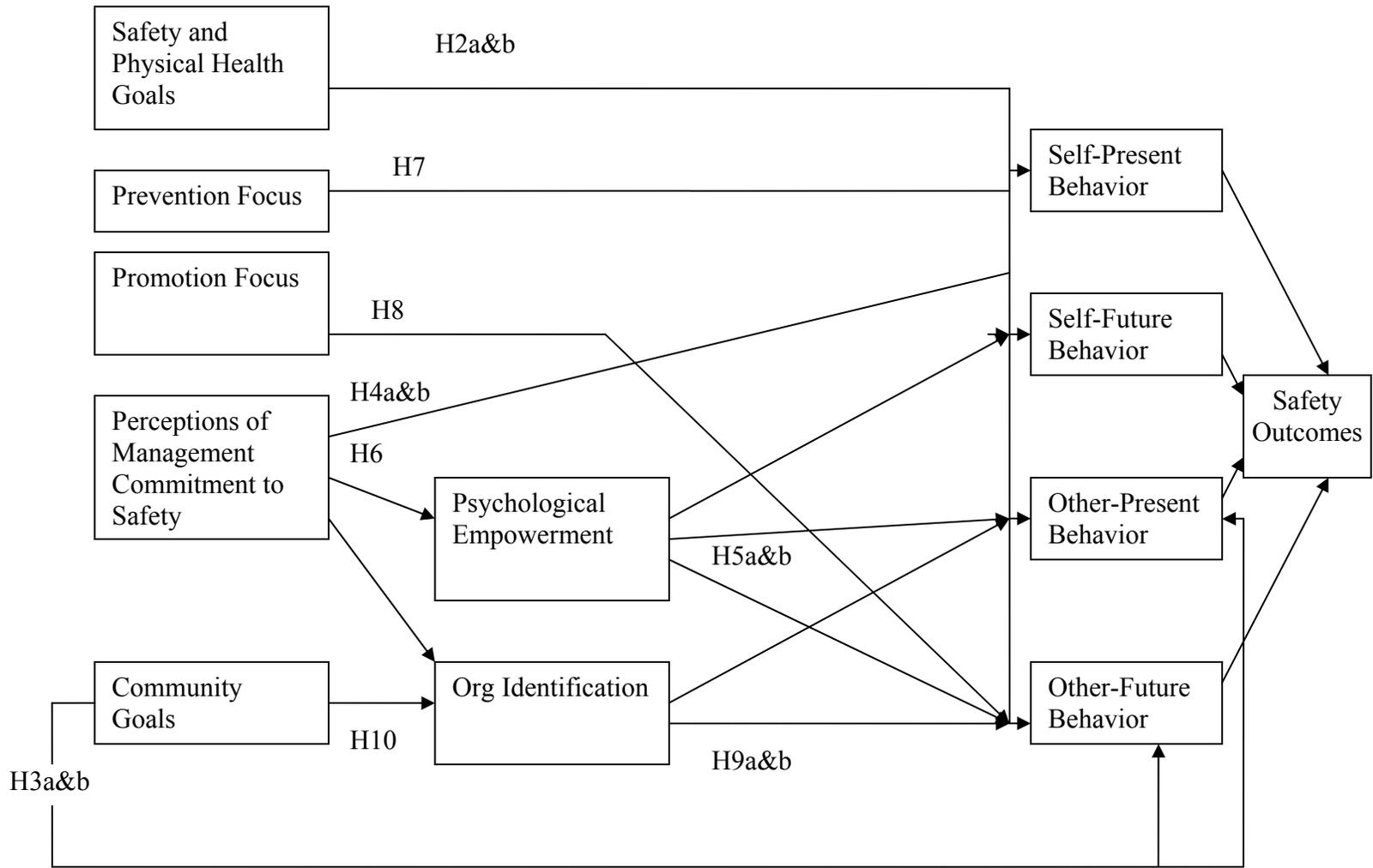
Figure 2. *Summary of Hypotheses*

Method

Participants

The participants in this study were employees of a small community hospital with 1317 employees. Surveys were distributed to approximately 950 of these employees and 198 were completed and returned, making for a response rate of approximately 21 percent. Respondents were 72 percent women. Their race/ethnicity was distributed as follows: 55 percent White, 28 percent Black or African American, 12 percent Asian, and 5 percent of another race or more than one race. There was a relatively even distribution across levels of tenure, with 21 percent having been there for less than one year, 17 percent from 1 year to less than 3 years, 11 percent from 3 years to less than 5, 25 percent from 5 years to less than 10, 16 percent from 10 years to less than 20, and 12 percent for 20 years or more. Age was also fairly evenly distributed, with 16 percent between 20 and 30 years old, 26 percent between 30 and 40, 31 percent between 40 and 50, and 27 percent 50 years of age or older.

There were several occupations and units represented among the survey respondents. These included, in no particular order, surgery, rehabilitation, joint replacement, nutrition, emergency, critical care, security, patient transport, pharmacy, psychiatry, and ultrasound. Twenty one respondents did not report the unit that they worked in. Twenty six percent reported being a manager or a supervisor.

Procedure

Participants were each distributed one survey with a series of measures, specified below. Some respondents completed surveys in departmental meetings and placed the responses in a box that was not seen by their supervisors. Other respondents were distributed surveys in their mailboxes and completed them on their own. These respondents returned the surveys to a box as well. No personal identifiers were collected on the surveys in order to remove any potential for respondents to be identified, which would have been the primary risk to the participants had identifiers been collected. In addition, this preserved confidentiality and encouraged honesty in the participants' responses.

At the department level, hospital record data were also gathered on work-related illnesses and injuries. These were retrieved from official hospital records and assessed conditions such as bruises, sprains, punctures, lacerations, pain, and skin irritation. These counts were then divided by department size to compute department rates per person. These data were gathered for each of the 4 years previous to the administration of the survey.

Survey Measures

Principle Goals. The principle goals of safety, physical health, and community were measured from scales in Kasser and Ryan's Aspiration Index (Kasser & Ryan, 1993; Kasser & Ryan, 1996; Grouzet, 2005). The physical health scale had 5 items, the safety scale had 4 items, and the community scale had 3 items. These scales are part of a 57-item index that measures 11 categories of life goals. In this study, one of the items

from the health scale was removed for brevity. Coefficient alphas for the three scales were .75, .87, and .63, respectively.

Psychological Empowerment. Psychological empowerment was assessed with Spreitzer's (1995) scale, which has 12 items. These items measured 4 dimensions: meaning, competence, self-determination, and impact. Three items were used to assess each dimension. In this study, coefficient alphas for the individual scales were .87, .85, .87, and .93, respectively.

Perceptions of Management Commitment to Safety. Perceptions of management commitment to safety were assessed with six items from Zohar's (2000) 10-item group safety climate scale. These items assessed two dimensions, supervisor actions and supervisor expectations. While it is labeled a safety climate scale, it is appropriate for assessing management commitment to safety in that all items directly assess managers' actions and/or expectations with respect to safety. In this survey, for brevity, scales assessing each dimension were shortened to 3 items, eliminating the two items that had the lowest factor loadings from each scale in Zohar's (2000) paper. These scales were then combined into an overall management commitment to safety scale, which had a coefficient alpha of .83.

Organizational identification. Organizational identification was measured with Mael and Ashforth's (1992) 6-item organizational identification scale. To measure organizational identification, "school" was replaced by "my work organization." One of the items was removed in this study. The coefficient alpha for the 5-item scale was .87.

Regulatory focus. Lockwood, Jordan, and Kunda's (2002) regulatory focus scale was used to assess promotion and prevention focus. The items were reworded to reflect work-specific regulatory focus. For example, the item "In general, I am focused on preventing negative events in my life" was reworded to state "In general, I am focused on preventing negative events at work." The original scales had 9 items each for promotion and prevention focus. One item was removed from each for brevity. Coefficient alphas in this study for promotion and prevention focus were .80 and .74, respectively.

Safety Behaviors. Twelve safety behaviors were included in this survey, three from each of the four proposed safety dimensions: self-present focused, self-future focused, other-present focused, and other-future focused. Interrater reliability and agreement from a pilot study assessing the temporal and social distance associated with these behaviors is shown in Appendix B, Table 1. Behaviors from each of the four proposed dimensions were selected for inclusion based on their high levels of interrater agreement and placement along the psychological distance dimensions. These were then reviewed, modified and selected based on a meeting with a clinical nursing specialist and other researchers at the hospital. The selected behaviors are shaded in Appendix B, Table 1.

For each behavior, participants were asked one question with responses on a 5-point Likert scale. The question stem read "For each behavior, indicate how often you perform this behavior." Responses anchors were as follows: *much less than the average employee, less than the average employee, about the same as the average employee, more than the average employee*, and *much more than the average employee*. Respondents

were ensured that managers or coworkers would not see their individual responses.

Coefficient alphas for the self-present, self-future, other-present, and other-future

dimensions were .90, .83, .91, and .89, respectively.

Measurement Model

All measurement models were tested using *LISREL 8.72* (Joreskog & Sorbom,

2003). The total sample size was not large enough to test the entire measurement model

at once, so each construct was assessed individually and item parcels were then

constructed in order to test the structural model. Individual factor loadings for all

predictors (not safety behavior items) are seen in Appendix D, Table 1. All items were

kept except for two items each from the promotion and prevention focus scales, each of

which had loadings below .40.

For the safety behavior items, fit for the four-dimensional structure was tested in

one structural model. Fit for the 4-factor model was strong on most indices, NFI = .96,

CFI = .97, SRMR = .06. The RMSEA was .12, which is higher than would be preferred.

However, models such as this with a small number of items (12 in this case) are by

default likely to have higher RMSEA values due to their lower degrees of freedom

(McCallum, Browne, & Sugawara, 1996). Fit for this model was compared to that for a

two-factor model, dividing safety performance into task and contextual performance

dimensions. Fit for this 2-factor model was significantly worse than that for the proposed

4-factor model, $\Delta\chi^2$ (2) = 31.14, $p < .01$. Therefore, the original four factors were kept.

Factor loadings for these factors are in Appendix D Table 2.

Because the number of items in the survey precluded the reliable estimation of measurement and structural parameters, item parcels were used as the observed variables in order to test the hypotheses. Item parceling is a technique where multiple items are combined into an item parcel, which serves as an observed variable. Sass and Smith (2006) demonstrated that using item parcels results in structural coefficients between latent variables that are similar or identical to those found when individual items are used. Hall, Snell and Faust (1999) conducted simulations on the use of two different item-parceling techniques and found that the isolated uniqueness strategy resulted in more accurate parameter estimates and fit indices. Based on this evidence, the isolated uniqueness strategy was used to create item parcels of two items per parcel.

If there were 3 items in a scale, two items were combined and third item was included by itself. Following the isolated uniqueness strategy, items with the highest factor loadings in the original confirmatory factor analysis were first combined, followed by those with the next highest loadings, with this process continuing for all items down to those with the lowest loadings. This method combined items with a secondary influence into the same parcel, since these items tend to have inflated factor loadings. For empowerment, the scale means for meaningfulness, competence, self-determination, and impact were used as single indicators, consistent with Spreitzer's (1995) conceptualization of psychological empowerment as a single higher-order construct. Fit for this full measurement model was adequate to continue with hypotheses testing, RMSEA = .07, CFI = .92, SRMR = .07.

Results

There were some notable findings from the correlation matrices (see Table 2 and 3 for scale and factor correlations, respectively). Most of the variables had high means relative to their scale, indicating negatively skewed distributions. Empowerment (i.e., meaning, competence, self-determination, and impact), management commitment to safety, and organizational identification had increasingly positive correlations with behaviors that had higher psychological distance. Several of the hypothesized predictors were also correlated with each other. Health, safety, and community goals had intercorrelations ranging from .32 to .47. Meaning, self-determination, and impact had correlations with management commitment to safety of .29, .36, and .47, and correlations with organizational identification of .42, .40, and .59. These results indicate that there was some colinearity among the predictors that could impact path coefficients from the hypothesized model.

Supplementary analyses of group differences in correlations between predictors and safety behaviors found that the number of relations that significantly differed across groups was about what would be expected by chance, suggesting the correlations were generalizable across groups (see Appendix D, Table 3).

Table 2.

Correlations Among Study Variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Meaning	4.71	.45	(.87)														
2. Competence	4.68	.46	.23	(.85)													
3. Self-determination	4.04	.78	.31	.35	(.87)												
4. Impact	3.52	1.03	.30	.22	.50	(.93)											
5. Management Commitment to Safety	4.03	.75	.29	.12	.36	.47	(.83)										
6. Organizational identification	3.87	.80	.42	.13	.40	.59	.43	(.87)									
7. Promotion focus[a]	6.67	1.69	.22	.03	.08	.20	.02	.35	(.80)								
8. Prevention focus[a]	4.81	1.74	.01	-.10	-.05	-.05	-.16	.04	.46	(.74)							
9. Community goals	4.45	.55	.30	.32	.19	.22	.23	.30	.28	.05	(.63)						
10. Health goals	4.41	.65	.10	.18	.13	.06	.03	-.02	.07	.13	.45	(.87)					
11. Safety goals	4.31	.67	.16	.13	.01	.02	.09	-.04	.04	.14	.32	.47	(.75)				
12. Safety self-present	3.92	.82	.11	.19	.08	.03	.00	.06	.25	.18	.27	.14	.14	(.90)			
13. Safety self-future	3.78	.78	.13	.26	.14	.09	.06	.10	.27	.25	.31	.13	.05	.77	(.83)		
14. Safety other-present	3.95	.79	.17	.25	.21	.25	.19	.19	.29	.24	.35	.11	.01	.64	.79	(.91)	
15. Safety other-future	3.84	.85	.18	.22	.22	.30	.17	.22	.27	.24	.27	.10	-.01	.61	.72	.85	(.89)

N = 191-197
[a]On a 9-point scale
Note: Correlations .14 or above in magnitude were significant at the .05 alpha level; coefficient alphas are on the diagonal

Table 3.

Correlations Among Latent Constructs

	1	2	3	4	5	6	7	8	9	10	11	12
1. Empowerment	-											
2. Management Commitment to Safety	**.69**	-										
3. Organizational identification	**.74**	**.54**	-									
4. Promotion focus	**.25**	.10	**.46**	-								
5. Prevention focus	-.03	-.12	.08	**.65**	-							
6. Community goals	**.42**	**.33**	**.50**	**.44**	.07	-						
7. Health goals	.15	.11	-.02	.06	.17	.66	-					
8. Safety goals	.12	.09	-.02	.06	.19	.53	.58	-				
9. Safety self-present	.06	-.03	.07	**.22**	**.25**	**.39**	**.18**	.16	-			
10. Safety self-future	.14	.05	.14	**.31**	**.34**	**.50**	.16	.08	**.91**	-		
11. Safety other-present	**.33**	**.19**	**.22**	**.34**	**.31**	**.51**	.13	.03	**.71**	**.92**	-	
12. Safety other-future	**.34**	**.20**	**.26**	**.31**	**.30**	**.40**	.11	.00	**.67**	**.85**	**.95**	-

Coefficients in **bold** were significant at the .05 alpha level.

Hypotheses of Correlations

Hypotheses concerning correlations among the constructs were first tested through examination of correlations among latent factors. Where differential correlations were hypothesized, chi-square tests were used to compare a model with the correlations set equal to a model with no such restriction.

Hypotheses 1a and 1b stated that health and safety goals are positively related to all types of safety behaviors and that they are more strongly related to future-focused behaviors. The health goals factor was significantly related to self-present safety behaviors but not significantly related to the performance of other types of safety behaviors. Safety goals were not significantly related to any of the safety performance dimensions. Therefore, Hypotheses 1a and 1b were not supported.

Hypothesis 2a was supported in that community goals were significantly related to other-present and other-future safety behaviors, $\varphi = .51$ and .40, respectively, $p < .05$ for both. However, these correlations were not significantly greater than those between community goals and self-present behaviors, $\Delta\chi^2(1) = 1.55$ and $\Delta\chi^2(1) = 0.08$, respectively, both n.s. Therefore, hypothesis 2b, which stated that community goals have more positive relations with other-focused behaviors than self-focused behaviors, was not supported.

Hypothesis 3a was partially supported, as management commitment to safety was related to other-present and other-future safety behaviors, $\varphi = .19$ and .20, respectively, $p < .05$ for both. However, management commitment to safety was not related to self-present or self-future behaviors, $\varphi = -.03$ and .05, respectively, both n.s. Management

45

commitment to safety was more strongly related to other-present behaviors and other-future behaviors than self-present behaviors, $\Delta\chi^2(1) = 10.17$ and $\Delta\chi^2(1) = 10.33$, respectively, both $p < .05$. These results indicate that management commitment to safety was more positively related to other-focused behaviors than to self-present behaviors. However, management commitment to safety was not more positively related to self-future behaviors than self-present behaviors, $\Delta\chi^2(1) = 2.01$, n.s. These results provide partial support for Hypothesis 3b, which stated that management commitment to safety is more strongly related to future- and other-focused behaviors than to self-present behaviors.

Hypothesis 4a was partially supported, as empowerment was significantly related to other-present and other-future behaviors, $\varphi = .33$ and .34, respectively, $p < .05$ for both. Empowerment was not significantly related to self-future behaviors, $\varphi = .14$, n.s. Empowerment was more positively related to other-present and other-future behaviors than self-present behaviors, $\Delta\chi^2(1) = 12.64$ and $\Delta\chi^2(1) = 13.21$, respectively, $p < .05$ for both. However, empowerment was not more positively related to self-future behaviors than to self-present behaviors, $\Delta\chi^2(1) = 1.40$, n.s. Therefore, empowerment was more strongly related to other-focused behaviors than self-present behaviors, providing partial support for Hypothesis 4b. However, empowerment was not more strongly related to self-future behaviors than self-present behaviors, failing to support that part of the hypothesis.

Hypothesis 6 was supported, as prevention focus was significantly correlated with self-present, self-future, other-present, and other-future behaviors, $\varphi = .25, .34, .31,$ and

.30, respectively, $p < .05$ for all relationships. With respect to hypothesis 7, promotion focus was significantly related to self-future, other-present, and other-future behaviors, φ = .31, .34, and .31, respectively. However, these correlations were not significantly greater than the correlation with self-present behaviors ($\varphi = .22$), $\Delta\chi^2(1) = 1.51, 2.51,$ and 2.02, respectively, all n.s. Therefore, promotion focus was significantly related to the performance of all safety behaviors, but not more strongly related to psychologically distant behaviors than psychologically close behaviors. Therefore hypothesis 7 was partially supported.

Supporting hypothesis 8a, organizational identification was significantly related to other-present and other-future behaviors, $\varphi = .22$ and .26, $p < .05$ for both. These correlations were both significantly greater than the correlations with self-present behaviors, $\Delta\chi^2(1) = 4.27$ and 7.38, respectively, $p < .05$ for both. Organizational identification was more strongly correlated with other-future behaviors than self-future behaviors, $\Delta\chi^2(1) = 6.03, p < .05$, but not more strongly correlated with other-present behaviors than self-future behaviors, $\Delta\chi^2(1) = 3.03, p > .05$. Therefore, three out of the four differences in correlations between organizational identification and self- and other-focused behaviors were significant, with organizational identification a stronger correlate of other-focused behaviors. This provided partial support for hypothesis 8b.

Model and Mediation Hypotheses

Results from the hypothesized model, which was tested by freeing structural paths among latent variables, had several notable results (see Tables 4 and 5). The only significant predictors of safety behaviors were empowerment and promotion focus. The

path coefficients from empowerment to other-present ($\beta = .40$) and other-future ($\beta = .36$) safety behaviors were both significant, whereas the path coefficients to self-present ($\beta = -.04$) and self-future ($\beta = .09$) safety behaviors were not. Promotion focus was also a significant predictor of self-future behaviors ($\gamma = .26$) and other-present behaviors ($\gamma = .29$). Organizational identification was not a significant predictor of other-focused behaviors. This is likely because of its strong relationship with psychological empowerment, $\varphi = .74$, which was also included as a proximal predictor of safety behavior and had a similar pattern of correlations with the different safety behavior dimensions.

The first mediation hypothesis, hypothesis 5, stated that empowerment mediates the relationship between perceived management commitment to safety and psychologically distant behaviors. Because in this study empowerment was only significantly related to other-focused behaviors, empowerment was only tested as a mediator between management commitment to safety and other-focused behaviors. Management commitment to safety was strongly related to empowerment, as indicated by the path coefficient of .71, $p < .05$, in the hypothesized model. Empowerment was significantly related to other-focused behaviors, with path coefficients of .40 and .36 for the two dimensions, $p < .05$ for both. Since these paths were all significant, there appeared to be at least partial mediation, such that the relationship between management commitment to safety and other-focused behaviors was partially explained by psychological empowerment. To test for complete mediation, a direct path between management commitment to safety and other-present behaviors was added. This did not

significantly improve fit, $\Delta\chi^2(1) = 0.07$, n.s. The same was true when a path to other-

future behaviors was added, $\Delta\chi^2(1) = 0.01$, n.s. This suggests that empowerment

completely mediated the relationship, supporting the hypothesis.

Since organizational identification was not a significant predictor of other-focused

behaviors in the model's results, it could not have been a mediator of the relationship

between community goals and other-focused behaviors. Therefore, hypothesis 9, the

second mediation hypothesis, was not supported.

Table 4.

Model Fit Indices

	df	χ^2	RMSEA	SRMR	CFI
Final Measurement Model	368	797.95	.07	.07	.92
Initial model	385	861.64	.07	.09	.92
Revised model: freeing path from community goals to other-present behaviors	384	857.01	.07	.08	.92
Final model: freeing path from promotion focus to organizational identification	383	833.23	.07	.08	.92

Table 5.

Path Coefficients From the Hypothesized Model

		Empowerment	Org ID	Self-Present Safety	Self-Future Safety	Other-Present Safety	Other-Future Safety
Exogenous Predictors	Promotion Focus			.19	**.26**	**.29**	.18
	Prevention Focus			.07	.11	.09	.17
	Health Goals			.14	.17	.17*	.14
	Safety Goals			.06	-.04	-.11	-.13
	Management Commitment to Safety	**.71**	**.51**				
	Community Goals		.15*				
Endogenous Predictors	Empowerment			-.04	.09	**.40**	**.36**
	Organizational Identification			.02	-.05	-.20	-.09
	R²	.51	.33	.11	.15	.23	.21

Coefficients in **bold** were significant at the .05 alpha level. Coefficients with an asterisk were significant at the .10 alpha level, two-tailed, or .05 alpha level, one-tailed.

Model Modifications

There were two paths that were freed in order to improve model fit. First, the direct path between community goals and other-present safety behaviors was added. This significantly improved fit, $\Delta\chi^2(1) = 4.63$, $p < .05$. The coefficient was positive, $\gamma = .31$, $p < .05$, suggesting that community goals were positively related to other-present safety behaviors even when controlling for the other predictors.

The second adjustment was the addition of a path from promotion focus to organizational identification. Modification indices suggested there would be a significant

improvement in fit and there was a strong correlation between the two factors. Although empirically based, this adjustment made theoretical sense given the framework taken in this paper suggesting that individuals in a promotion focus would have a more distal psychological focus. Organizational identification reflects a more socially distant and collective focus that may result from a promotion focus at work. In addition, research has shown that regulatory focus influences interpersonal behavior relative to in-group and out-group members (Brazy & Shah, 2006). More specifically, those in a promotion focus tend to have an approach focus relative to friendship by engaging in behaviors such as supporting and strengthening friendships, whereas those in a prevention focus are more concerned with avoiding the loss of friends (Higgins, Roney, Crowe, & Hymes, 1994). Furthermore, those in a promotion focus have been found to sit closer to in-group members and were more attracted to in-group members when given the choice in a laboratory task, whereas those in a prevention focus have been found to sit farther from and avoid out-group members (Shah, Brazy, & Higgins, 2004). Therefore, it makes sense that those in a promotion focus may develop a stronger collective identity with coworkers and the organization. This modification resulted in improved fit, $\Delta\chi^2(1) = 23.78$, $p < .05$. See fit indices and path coefficients for the revised final model in Tables 4 and 6. Path coefficients are illustrated in Figure 3.

Table 6.

Path Coefficients from the Final Model

		Empowerment	Org ID	Self-Present Safety	Self-Future Safety	Other-Present Safety	Other-Future Safety
Exogenous Predictors	Promotion Focus		**.36**	.18	.27*	.12	.21
	Prevention Focus			.08	.13	.29	.19
	Health Goals			.14	.16	-.04	.13
	Safety Goals			.06	-.04	-.18	-.13
	Management Commitment to Safety	**.71**	**.54**				
	Community Goals		-.04			.31	
Endogenous Predictors	Empowerment			.00	.14	**.44**	**.41**
	Organizational Identification			-.02	-.10	-.28	-.14
	R^2	.50	.45	.10	.15	.27	.22

Coefficients in **bold** were significant at the .05 alpha level, two-tailed. Coefficients with an asterisk were significant at the .10 alpha level, two-tailed, or .05 alpha level, one-tailed.
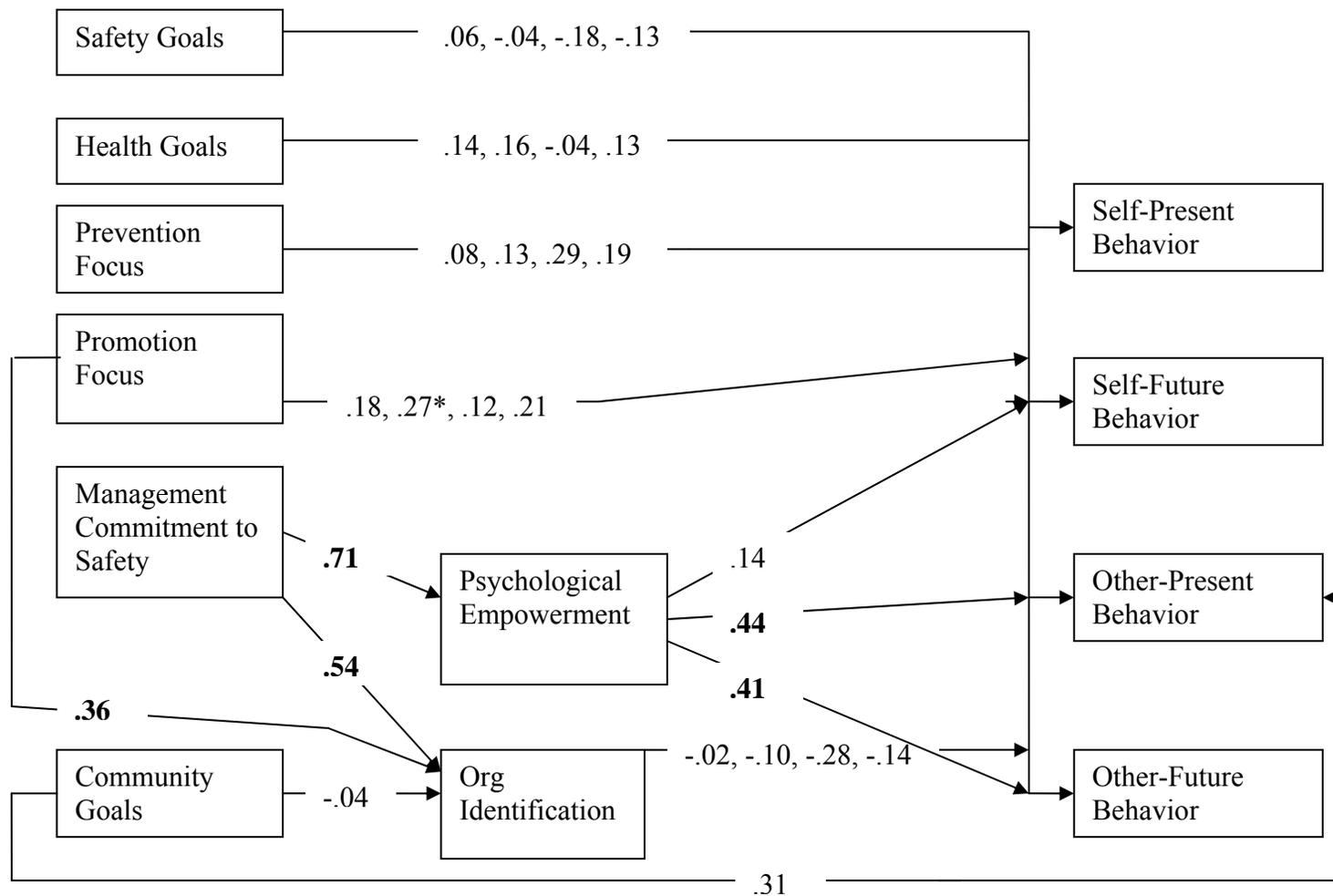
Note: **Bold** indicates *p* < .05; * indicates *p* < .10; when there is a path from a predictor to all safety behaviors, correlations are listed from left to right as self-present, self-future, other-present, and other-future

Figure 3. *Path Coefficients for Final Model*

Department-Level Analyses

        Hypotheses 10-12 were tested at the department level. Participants who belonged to departments for which we only had 1 or 2 respondents were removed. Participants who did not report their department and could not be identified as a member of a specific unit were also removed. This resulted in the removal of 23 participants, leaving 175 for department-level analyses. These 175 participants were in 18 departments. The number of respondents in a department varied considerably, ranging from 4 to 32. The actual size of the departments also varied in size so this variability was not surprising.

        An ANOVA was conducted to examine mean differences across departments. There was not an overall effect of department on self-present safety behaviors, $F(1, 17) = 1.42$, $p > .05$. However, there were significant differences across departments in self-future behaviors, $F(1, 17) = 2.69$, $p < .05$, other-present behaviors $p < .05$, $F(1, 17) = 2.09$, $p < .05$, and other-future behaviors, $F(1, 17) = 2.64$, $p < .05$. The percent of variance between groups for these four types of behaviors was 14, 23, 19, and 22, respectively.

        Safety behaviors, empowerment, and organizational identification were aggregated to the department level by taking the mean within each department. This constitutes an *additive* model according to Chan's (1998) typology, which treats the group-level constructs as summations of lower-level units. The additive model was used instead of the *direct consensus* or *referent shift* model because these latter two models require consensus for there to be a higher-level construct. In the case of department safety performance, there does not need to be agreement on behaviors for department

performance to exist. Variability within departments does not mean that scores cannot be aggregated. The behaviors of one employee may compensate for or add to the behaviors of another employee in the same department. The same could be said for attitudes such as organizational identification and empowerment. In each of these cases, referent or object being rated is not the same across individuals.

Management commitment to safety was aggregated also by taking the mean at the department level. However, this constitutes a *direct consensus* model since respondents within each department had the same referent, management. The ICC for management commitment to safety was .06, with approximately 15 percent of the variance in perceptions of management commitment to safety was between departments. This ICC value falls within the typical range in organizational research (Bliese, 2000), suggesting there was enough between-group variance relative to within-group variance to justify aggregation.

The means for these variables were correlated with employee occupational-related injury and illness rates. Injury and illness counts at the department level were obtained from hospital records and divided by the number of employees in each group to compute a rate that was comparable across groups. Rates were computed covering each of 4 years before the administration of the survey. Means and standard deviations are in Table 7. Correlations between each group-level variable and injury/illness rates over the previous 4 years are listed in Table 8. Only 17 groups were available for this analysis (1 group had to be dropped due to inadequate injury/illness rate data).

Other-present, $r = -.01$, $p > .05$, and other-future, $r = -.17$, $p > .05$, safety

behaviors were not significantly related to injury/illness rates. Therefore, hypothesis 10

was not supported. Empowerment, $r = -.55$, $p < .05$, and organizational identification, $r = -.49$, $p < .05$, were negatively related to injury/illness rates, supporting hypothesis 11.

Management commitment to safety was not significantly correlated with injury/illness

rates, $r = -.33$, $p > .05$, failing to support hypothesis 12.

Table 7.

Department Safety Injury/Illness Rates- Descriptives

	Mean	SD	Min	Max
Previous Year	.13	.08	.00	.27
Two Years Previous	.14	.09	.00	.35
Three Years Previous	.16	.10	.00	.41
Four Years Previous	.18	.10	.00	.35

N = 17 groups

Table 8.

Correlations Between Scale Means and Illness and Injury Rates

Predictor	Correlation With Rates Over Previous 4 Years
Empowerment	**-.55**
Organizational identification	**-.49**
Management commitment to safety	-.33
Self-present safety	-.04
Self-future safety	-.05
Other-present safety	-.01
Other-future safety	-.17

N = 17 groups
Note: Correlations in bold are significant at the .05 alpha level.

Discussion

The purpose of this study was to examine predictors of safety behaviors that are intended to influence psychologically distant outcomes. Results from this study suggest that psychological empowerment, a cluster of psychological states reflecting meaningfulness, self-determination, self-competence, and impact, is related to the performance of behaviors focused on the safety of others and the worksite as a whole while unrelated to the performance of behaviors focused on one's own safety. Furthermore, psychological empowerment mediated the relationship between management commitment to safety and the performance of other-focused safety behaviors. When aggregated to the department level, empowerment was negatively related to injuries and illnesses. This suggests that departments with higher levels of psychological empowerment have employees who are more likely to take action to improve the safety of others and the work environment as a whole and are less likely to experience negative health and safety outcomes. Perhaps most noteworthy, when several predictors were included in a single model predicting safety behaviors, empowerment emerged as the primary predictor of other-focused safety behaviors.

Among other notable findings, management commitment to safety and organizational identification were also more strongly related to other-focused than self-focused behaviors. Community goals were related to all types of safety behaviors

identified, whereas health and safety goals were unrelated to these behaviors. Unexpectedly, both promotion and prevention focus were related to all types of safety behaviors, a finding that warrants further discussion.

Regulatory Focus

In one of the surprising findings from this study, contrary to findings from previous studies on regulatory focus and safety performance (e.g., Wallace, in press; Wallace & Chen, 2006), promotion focus was positively related to all types of safety behaviors. Studies by Wallace and colleagues found safety was negatively correlated with promotion focus and in this study it was expected that only other-focused behaviors would be positively related to a promotion focus. There are two likely reasons for the different findings from this study, one substantive and one methodological. First, although they did not report all six items used to assess safety performance, Wallace and Chen's (2006) study appeared to focus on task safety behaviors. The two examples they gave for items they used were "Generally carries out work in a safe manner," and "Uses all necessary safety equipment." These and the other four items were based on Burke et al.'s (2002) measure, which does not explicitly incorporate other-focused behaviors, and Stetzer and Hofmann's (1996) measure, which focused on the performance of unsafe behaviors, not contextual safety behaviors. A promotion focus entails motivation towards ideals and improving the situation (Higgins, 1997), rather than just maintaining current safety and stability. Behaviors measured in this study, such as helping a coworker learn safe work procedures and making suggestions about how to improve

safety, entail such an orientation that goes beyond maintaining the current situation and focuses on psychologically distant outcomes.

The second potential explanation for the discrepancy between this study and Wallace and Chen's (2006) study is methodological. First, Wallace and Chen used a measure of work-specific regulatory focus that appears to overlap considerably with safety climate scales. Items in the promotion focus scale predominantly reflect a focus on productivity over safety (e.g., "accomplishing a lot of work", "getting my work done no matter what"). Although predictive of safety performance, this does not appear to capture the full promotion focus construct as defined by Higgins (1997) and as measured by Lockwood, Jordan, and Kunda's (2002) scale. Additionally, Wallace and Chen used a longitudinal, multisource design, collecting safety behavior ratings from supervisors, whereas this study used self-reports of safety behaviors.

Another notable finding was that work-specific promotion and prevention focus were moderately correlated in the positive direction. This is contrary to Lockwood et al.'s (2002) study, which found a much smaller positive correlation between the two and Wallace and Chen's (2006) study, which found no correlation. The difference with Wallace and Chen's (2006) findings might be due to the measures used. The difference with Lockwood et al.'s correlation is more surprising, given that the same measures were used. It is possible that differences in the data collection settings contributed to the difference in the observed correlation. Data in this study were collected at work to assess work-specific regulatory focus. It may be that a high state of attention and self-regulatory activity underlies both promotion and prevention foci at work such that

individuals who are highly attentive to current and future states at work focus intensely on both the avoidance of losses and the achievement of gains. Therefore, when safety is actively espoused, as in hospitals, individuals may in some cases maintain a high promotion and prevention focus. Perhaps these two constructs are more distinct in other aspects of life such as when measured in the laboratory to assess general regulatory focus, as in Lockwood et al.'s study.

Goals and Construal Level

The hypotheses suggesting that higher-order values and goals are stronger predictors of psychologically distant safety behaviors were not supported. One potential reason for the lack of support for the hypotheses regarding goals is that participant's full goal systems were not measured. Kasser and Ryan (1993) used a method where individuals rank-ordered health, safety, and community goals along with various other goals such as financial success and image. Such a method may have been more useful here.

It is also possible that findings in lab studies with respect to construal level do not generalize to field settings. It may be that individuals use higher-order goals for a variety of safety behaviors regardless of outcome psychological distance; safety behaviors can also have both psychologically close and psychologically distant safety outcomes, blurring the distinction between these types of behaviors and their associated construals. This may in part explain why no differential relations were found in this study. Safety and health goals may also be too distal from workplace safety behaviors to have a measurable effect on their performance.

60

Interestingly, community goals, which reflect an importance on assisting others, making the lives of others better, and making the world a better place, were similarly related to all four types of safety behaviors measured here. One potential reason for the lack of differential relations with self- and other-focused behaviors is that in hospital settings many safety behaviors are focused more on the safety of others, particularly patients, than they would be in other settings. For example, using the appropriate protective equipment, which typically protects oneself from injury, may also have implications for patient safety in hospitals, blurring some of the motivational distinctions across the self- and other-focused behaviors. Still, when taking other predictors into account, community goals were significantly related to other-present safety behaviors and unrelated to other types of behaviors. Perhaps when other psychological states are accounted for, community goals emerge as incrementally important for some other-focused behaviors but not for self-focused behaviors.

Department-Level Analyses

Injury and illness rates over the previous 4 years were related empowerment and organizational identification. It is not clear whether these relations are causal or spurious. It is possible that these psychological states resulted in more psychologically distant safety behaviors, which in turn reduced accident rates. However, since the relation between self-reported behaviors and outcomes was not significant, this conclusion may not be warranted.

There are two other plausible explanations for these observed relations. First, empowerment and organizational identification may have decreased in response to

61

accidents and injuries. This is possible given the nature of the design, with outcomes recorded over the previous 4 years being correlated with current reports of behavior. Second, these psychological states and safety outcomes may share a cause. Occupations or units with greater exposures and susceptibility to injury may also experience fewer structurally empowering characteristics, meaning that characteristics of the work environment are a common source of each variable, creating a spurious correlation. Regardless of the explanation, there were significant relations among the psychological states and objectively measured safety outcomes that deserve attention in future research.

Limitations

The first limitation of this study is that behavior and attitude data came from the same source at a single point in time. This can create common method effects that inflate correlations among measured constructs and make causal inferences less justifiable. Also, despite the efforts made to ensure that participants knew their responses were confidential, it is possible that employees distorted their behavioral performance ratings. The construct validity of the safety criteria measures in this study was reduced to the extent that such distortion took place. This criticism could also be made of other highly-cited studies of safety performance that use similar self-report measures (e.g., Griffin & Neal, 2000).

Despite the limitations of the self-report design, alternative safety behavior measures would have had limitations as well. One alternative would have been to have a coworker rate the employee. Such a design would have introduced other concerns, such as the extent to which the coworker was able to observe the employee's performance of

the behaviors, the coworker's willingness to report positively or negatively about the employee, political issues within the organizations that would impact rater honesty, whether the employee would find out how he/she was rated, and the reduction of response anonymity for the original participant since their responses would have to be linked individually to the coworker's ratings. Another alternative, supervisor ratings, would have introduced issues that are similar to those for coworker ratings. Such limitations regarding supervisor ratings as performance indicators are well-documented (e.g., Murphy, 2008). Hence, although there are definitely limitations to self-report data in the measurement of safety behavior in organizations, it is not clear whether these limitations are more or less significant than those of using coworker or supervisor ratings.

To further address the limitations of using single-source data, attitude and behavior data were aggregated to the department level and correlated with department-level injuries and illnesses. Neal and Griffin's (2006) study found that self-reports of safety behavior did predict subsequent accidents at the group level, providing some evidence for the validity of self-report measures in occupational safety research. In this study, the psychological states of empowerment and organizational identification were also related to safety outcomes, although behavioral data were not.

A second potential limitation of this study was that participants were from different occupations within the hospital. Hence, the opportunities and requirements to perform the different types of safety-related behaviors may have been different across these occupations. However, as noted, multilevel analyses suggested that regression slopes did not vary across departments for almost all predictor-behavior relations. Hence,

although there were differences across occupations with respect to the mean performance of the behaviors themselves, this may not have impacted the correlations on which the modeling results were based.

A third limitation was that the data were collected from a hospital, which might limit the generalizability of some of the results to other settings. Safety behaviors at hospitals often incorporate the safety of patients as well as employees and their coworkers, which adds another potential dimension to safety performance in hospital settings. It might be useful in the future for researchers to examine differences and/or similarities between safety behaviors that impact the safety of coworkers and those that impact the safety of patients and other individuals from outside the organization.

Implications and Conclusion

Despite the aforementioned limitations, this study points to some distinctions in the motives for behaviors with intended outcomes that vary in psychological distance. Results suggest that psychological empowerment, management commitment to safety, and organizational identification are more positively related to the performance of behaviors with psychologically distant outcomes than those with psychologically close outcomes. Furthermore, empowerment and organizational identification were related to objective safety outcomes, suggesting that there may be a connection between these psychological states and safety that explain variance in safety performance beyond predictors that have been examined in the past. Finally, findings here suggest that the relations between regulatory focus and safety behavior may in part depend on the

measures of regulatory focus and safety performance used and the constructs those measures tap into.

With respect to practical implications, results suggest that structurally empowering characteristics that create psychological empowerment enhance safety performance in organizations. Wilkinson (1998) described structural empowerment in the form of information sharing, employee involvement in organizational decisions, task autonomy, and self-management. Creating these conditions might improve efforts toward shared governance and responsibility with respect to safety in industry. These conditions would be valuable in addition to the well documented need for management to prioritize safety (e.g., Zohar, 2003). Results also suggest that conditions that facilitate a promotion focus may help foster a stronger organizational identification and a greater willingness to engage in different types of safety behaviors. These findings are also consistent with those on high performance work systems and occupations safety (Zacharatos, Barling, & Iverson, 2005) which have found that practices such as self-management, reduced status distinctions, information sharing, and transformational leadership, all which are intended to help employees to identify with the goals of the organization and engage in continuous improvement practices.

In general this study suggests industrial safety may be enhanced through the incorporation of outcome psychological distance into safety performance's structure and motivation. By focusing on psychological states and goals beyond risk avoidance and incorporating an active work role orientation, collective identities, and management

commitment, organizations may help employees engage in safety behaviors that impact

others and the future of their worksite.

Appendix A: Dissertation Proposal Literature Review

Despite advances in safety engineering over the past few decades, workplace accidents and injuries continue to be a significant problem in organizations today. In the United States in 2005, 4.2 million workers suffered nonfatal injuries at work, while approximately 5,700 died due to fatal work-related injuries (Bureau of Labor Statistics, 2007). Most of these accidents involve some form of human error (Reason, 1990), with human behavior often as the last link in a chain of causes leading to accidents. It has also been noted that most accidents are rooted in systemic safety errors at the worksite level, such as errors in procedures and task designs (Reason, 1990), indicating that human errors are a symptom of failure at the worksite or organizational level. One way to prevent these systemic errors is to have employees who are motivated to behave proactively and to improve the safety of the work environment and who work in an atmosphere that supports this behavior. Human behavior is not only involved in the immediate causes of workplace accidents through the performance of work tasks; it is also involved in the distal causes of accidents through behaviors (or lack thereof) that influence the safety of the work environment.

In order to understand the motivational bases for work behavior that impacts safety, a framework for understanding the structure of safety behaviors is needed. Most research on workplace safety motivation has focused on safety behavior as one factor, and exceptions to this (e.g., Burke, Sarpy, Tesluk, & Smith-Crowe, 2002; Hofmann, Morgeson, & Gerras, 2003) have provided valuable, but limited distinctions among behaviors. Meaningful differences across safety-related behaviors can be used to guide future research on occupational safety, while pointing to differences in the motivational antecedents of distinct types of behaviors.

There is a general consensus in the motivation and self-regulation literature that most behavior, including safety-related behavior, is purposeful and guided by future states, such as goals and expected outcomes. One way to distinguish among safety behaviors is through the psychological distance of these goals and expected outcomes from the behavioral operant. Kurt Lewin (1951), in his attempt to develop a unifying field theory, made perhaps the first reference to psychological distance; according to Lewin, psychological distance referred to an event or subject's location in one's "life space." Two factors that contribute to psychological distance are temporal and social proximity, both of which impact how humans value and represent events. Applying this concept, safety-related outcomes are more psychologically distant when they are in the future and when they impact others; in contrast, safety outcomes are more psychologically close when they are in the present and they impact oneself. Work safety behaviors vary considerably in the temporal and social distance of their outcomes, which I hypothesize to have implications for the motivational bases for these behaviors. Evidence suggests that individuals identify, construe, and value actions and their outcomes differently along these dimensions. This may influence how individuals regulate their behavior relative to safety-related goals.

The first purpose of this research is to identify and verify two dimensions of psychological distance, temporal and social distance, that characterize the expected

outcomes of safety behaviors at work. The second purpose of this research is to identify motives that are particularly important for safety-related behaviors that have psychologically distant outcomes, since most research on safety motivation has focused on behaviors with psychologically close outcomes. I draw from self-regulatory theories of work and safety motivation, a growing literature on construal level theory, and theory on motivation in groups in developing hypotheses about motives for the pursuit of psychologically distant safety outcomes. If supported, these distinctions may have important implications for safety management, work design, and public policy with respect to safety-related working conditions.

To this end, I first review the current state of safety behavioral and motivation research by discussing research on occupational safety and performance and the existing distinctions that have been drawn in the safety performance domain. I then review self-regulation theory and research on work and safety motivation, with a focus on control theory and social-cognitive approaches. This is followed by the proposal of two dimensions along which safety behaviors vary: the immediacy of the behavior's outcomes and the extent to which the behavior is focused on others and the worksite as a whole. This is followed by hypotheses about the relative importance of principle goals, management commitment, and motivational states for behaviors that vary along each of the given dimensions.

Safety Behavior and Performance

Job performance is defined as behavior on the job with an evaluative component, meaning the behavior is judged by the extent to which it contributes to individual and organizational results (Motowidlo, Borman, & Schmit, 1997). These individual and organizational results are conditions that are changed by behavior and contribute to organizational goal accomplishment (Motowidlo, Borman, & Schmit, 1997). Safety performance can be seen as a subset of overall job performance in situations where worker safety is a concern. Safety performance is therefore perhaps best defined by the extent to which an individual performs behaviors that increase the safety of the individual and organization and avoids behaviors that decrease safety of oneself and the organization.

Research on general job performance has made a distinction between task and contextual performance (Borman & Motowidlo, 1993). Task performance refers to activities directly involved in the production and/or delivery of goods and services as well as activities that maintain the technical core. Traditionally, task performance has been the primary criterion in research on job performance, just as core task safety behaviors have been the primary focus of most safety research. The second criterion, contextual performance, has received more attention in the literature on job performance over the past 15 years. Contextual performance involves behavior that contributes to organizational effectiveness through its impact on the work environment. Contextual performance is less likely than task performance to involve behaviors that are part of one's prescribed role and typically includes behaviors that contribute to the quality of the work environment as a whole. Research has supported the distinction between task and contextual performance in organizational contexts and suggests that they have different predictors (Motowidlo & Van Scotter, 1994).

Recent research on contextual performance has also delved into two related constructs, organizational citizenship and voice behavior. Organizational citizenship behavior (OCB) is a multi-dimensional set of behaviors encompassing actions that contribute to the effectiveness of coworkers and the organization as a whole, including altruism, courtesy, conscientiousness, civic virtue, and sportsmanship (Organ, 1988; for a review, see Hoffman, Blair, Meriac, & Woehr, 2007). Graham (1991) used concepts from political philosophy to conceptualize organizational citizenship behaviors as similar to those that a responsible citizen of a state or country would perform. Using this framework, Graham identified three categories of civic citizenship responsibilities, obedience, loyalty, and participation, and applied them to organizational citizenship. Organizational citizenship behavior is related, but not redundant with task performance, as suggested in one meta-analysis of correlations between the two (Hoffman, et al., 2007).

Voice behavior has also been added to the cluster of behaviors encompassed by contextual performance (Van Dyne & LePine, 1998). Voice behavior has been defined as constructive change-oriented communication intended to improve the work situation (LePine & Van Dyne, 2001). This includes suggesting organizational improvements, making constructive suggestions, and suggesting how coworkers or others in one's work unit should carry out tasks (LePine & Van Dyne, 2001). LePine and Van Dyne (2001) demonstrated in a lab study that voice behavior was distinct from cooperative contextual behavior.

Despite the growing body of empirical research distinguishing different dimensions of job performance, most research on safety behavior at work has treated safety performance as one dimension encompassing a small set of behaviors that relate directly to the performance of core job tasks, such as taking risks and engaging in behavior to protect oneself, and following safety rules. Predating most published behavioral safety research, Andriessen (1978) distinguished between *carefulness* and actions *directed toward improving safety conditions*. However, this distinction appeared to have little influence on subsequent safety behavior research, which focused almost exclusively on rule-following and self-protection (e.g., Komaki, Collins, & Penn, 1982; Komaki, Heinzmann, & Lawson, 1980). This is not a critique of these behavioral research programs, which were and remain extremely valuable in providing breakthroughs on the roles of behavior and management in occupational safety. Rather it is an acknowledgement that this research tended to focus on some, but not all safety performance criteria.

Recently, empirical research has begun to address the distinction made by Andriessen (1978). *Safety compliance*, which refers to rule-following in core safety activities such as wearing personal protective equipment, has been shown to be distinct from *safety participation*, which refers to activities that enhance the safety context of the organization such as participating in voluntary safety activities (Burke et al., 2002; Griffin & Neal, 2000). In their study, Griffin and Neal (2000) found moderate correlations between safety compliance and safety participation, but there was no evidence that these categories were redundant. Neal and Griffin (2006) looked at lagged effects of organizational factors on safety compliance and participation and found \

moderate to high correlations between the two criteria, but they were not correlated enough to suggest combining them. Correlations between compliance and participation were also similar to those observed between general task performance and OCBs (Hoffman et al., 2007), suggesting that safety performance is similar in structure to general performance in this respect. This research indicates that while a significant portion of safety performance involves following rules and regulations with respect to safety, safety performance also reflects actions that go beyond this and are aimed at improving the safety of the work environment.

Burke, Sarpy, Tesluk, and Smith-Crowe (2002) developed and empirically tested a slightly more differentiated, but related structure for safety performance. Burke et al. proposed four dimensions to safety performance: 1) using personal protective equipment, 2) engaging in work practices to reduce risk, 3) communicating health and safety information, and 4) exercising employee rights and responsibilities. Their four dimensions roughly map on to the distinction between task and contextual performance noted in the general job performance literature (Borman & Motowidlo, 1993; Motowidlo & Van Scotter, 1994). The first two factors reflect general task performance with respect to safety, the first referring to the use of protective equipment to shield individuals from potential hazards and the second referring to the actual performance of tasks to assure safety. These behaviors both typically occur during core work tasks. The second two dimensions encompass behaviors that go beyond one's work tasks and could be considered part of contextual performance, since these behaviors contribute to the safety of the entire work group and organization. Communicating health and safety related information, the third dimension, involves communicating potential exposures to personnel responsible for site safety and appropriately reporting incidents, accidents, or illnesses. The fourth dimension, exercising employee rights and responsibilities, involves using reference materials that provide health and safety information and exerting the right to access and provide input into site health and safety policies. In terms of their contribution to safety outcomes (i.e., accidents and near misses) the first two dimensions cover proximal behavioral causes of accidents in the form of behaviors involving specific work role tasks. The second two dimensions are likely to influence contextual and environmental sources of error, which are the root cause of many, if not most, accidents (Reason, 1990).

In another study, Hofmann, Morgeson, and Gerras (2003) drew from research on general organizational citizenship behaviors (Van Dyne, Graham, & Dienesch, 1994; Van Dyne & LePine, 1998) and applied that research to workplace safety performance in developing a list of safety citizenship behaviors. They separated safety citizenship behaviors into six categories: helping, voice, stewardship, whistleblowing, civic virtue, and initiating safety-related change. These safety behaviors are similar to the organizational citizenship and voice-related behaviors from the general job performance literature. Safety-specific citizenship behaviors are an addition to the behaviors identified in Burke et al.'s (2002) structure in that they cover attempts by individuals to improve the safety of the worksite and organization as a whole. Some of these behaviors also overlap with those in Burke et al.'s "communicating safety-related information" dimension.

In summary, there has been a necessary expansion of the safety performance criterion domain in occupational safety research, although the body of research integrating additional dimensions of safety performance beyond self-protection remains relatively small. This body of research has theoretically and empirically demonstrated that safety performance is multidimensional. The fact that safety performance is multidimensional suggests the motivational bases for different types of safety performance are distinct, at least in part. An effective way to augment and further develop our understanding of safety performance might be to draw from their motivational bases as an organizing structure. Assuming that expected outcomes and goals form the fundamental basis for some, if not most, safety motivation, it is useful to discuss safety behaviors in terms of what outcomes or goals they are intended to aid in the pursuit of. The expected outcomes of safety behaviors vary along at least two dimensions of psychological distance: the timing and the target of the outcomes. These dimensions are the focus of this paper. Incorporating the intended goals of behaviors along these dimensions into research on safety motivation may shed light on the motivational, or "will-do," predictors of safety behaviors, particularly those with psychologically distant outcomes, and further explain the multidimensionality of safety performance. Before delving into these dimensions, it is first worth reviewing current theories of work and safety motivation, which provide a rationale for treating safety behaviors as a function of goals, expected outcomes, and self-regulatory processes.

Safety Motivation

Motivational processes are key to understanding why individuals engage in (or fail to engage in) acts that contribute to their own safety and that of the work environment. As stated above, most research on safety motivation, like most research on behavioral safety, has treated it as a unidimensional construct and focused solely on adherence to safety rules and regulations despite the multidimensionality of safety performance (Burke et al., 2002). In this sense, safety motivation research has followed a path similar to that of general job performance, first focusing on task behaviors while paying less attention to those behaviors that enhance the social and psychological environment for safety.

The multidimensionality of safety performance may be largely a function of differences in the motivational processes that drive behaviors with different intended outcomes. Motivation encompasses the processes that incite arousal, direction, and persistence in behavior (Mitchell, 1982). Self-regulation is a meta-framework for human behavior based on the notion that individuals consciously and subconsciously regulate their own state relative to goals. In occupational safety contexts, individuals regulate their behavior towards goals related to safety as well as those unrelated to safety. I propose that some of the elements of self-regulation that motivate safety performance may vary in their importance and operation with respect to goals of varying psychological distance. The dominant current approaches to self-regulation are control theory (Carver & Scheier, 1982) and social-cognitive theory (Bandura, 1986), both of which have elements in theoretical approaches to safety motivation; these theoretical approaches have primarily focused on self-protection and safe task performance but may also be extended to behaviors in other performance categories.

Control Theory

Control theory has received considerable attention over the past 25 years. According to Carver and Scheier (1982), control theory has three key concepts that have implications for behavior: goals, feedback, and goal-feedback discrepancies. Goals are internal representations of desired states, such as outcomes or events (Austin & Vancouver, 1996). Feedback refers to stimuli that provide information about the discrepancy between one's current state and one's goal state. In other words, goal-feedback discrepancies are the differences between feedback and goal states. According to control theory, as individuals passively or actively monitor their current state, they evaluate the discrepancy between current levels and desired levels, with these discrepancies leading to goal-striving activity and providing the motivation to act. Negative feedback loops develop as individuals compare their current state with the referent goal standard and behave in response to goal-feedback discrepancies in an attempt to eliminate them. They then receive new feedback based on their behavior and once again compare this new feedback to desired states, continuously repeating the same cycle or feedback loop. Goal-feedback discrepancies are the prime motivator in control theory, with greater discrepancies creating a greater motivation to act, all else being equal.

According to control theory, individuals hold multiple goals at different levels simultaneously operating. These goals are hierarchically organized at various levels of abstraction (Carver & Scheier, 1982). DeShon and Gillespie (2005) postulated that higher level goals specify the purpose of actions (i.e., the "why") and lower level goals specify the actions required to accomplish higher level goals (i.e., the "how"). The highest level goals are self goals, which are fundamental outcomes that all individuals must achieve. These are followed by principle goals which guide clusters of behavior, achievement goals which reflect action patterns that aid in the pursuit of principle goals, and action plan goals, which are mental models of action sequences that specify how to reach higher level goals. Newell (1990) proposed that these goals form feedback systems that include, in decreasing hierarchical level, social, rational, cognitive, and biological levels of processing. The biological levels involve little, if any, conscious attention and include neurons and neural circuits. At the cognitive level are deliberate acts and operations, which may or may not require conscious attention. Rational and social feedback loops include task sequences, guiding principles, and systems (Johnson, Chang, & Lord, 2006).

Lord and Levy (1994) also discussed linkages between higher-level and lower-level goals and suggested that higher-order discrepancies form the basis for lower level feedback systems, a proposition that has received empirical support from a variety of domains (Johnson, Chang, & Lord, 2006). Actions also have an identity structure that conforms to hierarchical feedback loops such that lower level identities of an action include details or specifics of the action, while higher level action identities are based on a more general understanding of the action and why it is done (Vallacher & Wegner, 1987). Therefore, as a task sequence becomes easier and requires less effort, it becomes identified as a whole rather than as a set of individual actions. Sequences of actions can also be seen as whole scripts, which form the basis for a purposeful behavior and goal

striving activities and are based on mean-goal associations (Lord & Kernan, 1987). Mean-goal associations refer to the association between certain behaviors and goal attainment, with stronger mean-goal associations resulting in stronger commitment toward behavioral goals (Shah & Kruglanski, 2000).

There are also horizontal linkages among goals at the same level. For example, putting effort toward one behavioral goal may take away from the effort that can be put toward other behavioral goals, creating a negative link among parallel goals. When goals are negatively associated, commitment towards individual goals tends to decrease (Shah & Kruglanski, 2000). This decrease in individual goal commitment may be part of an adaptive system of checks and balances to ensure that certain needs are not neglected, as a preoccupation with certain goals and a neglect of others is common source of maladaptive behavior (Epstein, 1998).

The primary theory of safety motivation associated with the control theory framework is risk homeostasis theory (Wilde, 1982). Although the theory did not specifically reference control theory, its framework and hypotheses are similar enough to suggest they came from a similar line of reasoning. Risk homeostasis theory, which was originally applied to driver behavior but has since received attention in other safety domains, suggests that individuals maintain a constant target risk level and modify their behavior to satisfy this target. According to this theory, "at any moment in time the instantaneously experienced level of risk is compared with the level of risk the individual wishes to take, and the decision to alter ongoing behavior will be made whenever these two levels are discrepant" (Wilde, 1982, p. 210). In industrial or other hazardous situations individuals take in information, anticipate the situation, and develop a perceived risk level. This is compared to the target level of risk, with discrepancies between the target level and the perceived level of risk leading to judgments about how to respond. Under this model, three skills predominantly impact risk and safety. Perceptual skills determine the accuracy of the risk perception, decision skills determine one's ability to respond to risk discrepancies, and machine-operating skills determine whether the decisions can be effectively carried out.

According to risk homeostasis theory, increases in skills and engineering advances are unlikely to have a lasting effect on accident rate unless the target risk level changes. More broadly, the theory suggests that motivational interventions beyond engineering advances are necessary to increase safe behavior and reduce accidents. Wilde (1982), in supporting his theory, cited studies such as those by Peltzman (1975), who discussed and analyzed the impact of the National Traffic and Motor Vehicle Safety Act of 1966 and the mandated car design changes for the purpose of increasing safety. Peltzman noted that while car design changes decrease the probability of an accident when drivers maintain the same level of what he called "driving intensity" (e.g., speed, thrill, etc.), it is possible that the demand for driving intensity is such that it will increase to the point where the probability of accident is no longer reduced. The article (Peltzman, 1975) concluded from a detailed analysis of accident rates that increased safety regulations did not reduce death rates. One interpretation of this finding is that drivers responded to the higher level of anticipated protection by taking more risks. If

this interpretation is correct, then the results could be argued to support risk-homeostasis theory.

Risk homeostasis theory has received considerable attention in the driving literature and risk-taking literature in general. One of the predictions of this theory is that individuals respond to factors that decrease risk with behaviors that increase risk to the target risk level. There is some support for this prediction. For example, the use of abdominal belts increases the weight that individuals prepare to lift (McCoy et al., 1988) and the amount that managers perceive as safe for their employees to lift (Bridger & Freidberg, 1999), suggesting that individuals keep constant their risk of injury while increasing effort towards performance output. Similarly, new seat-belt users have been found to increase their speed and decrease their following distance (Janssen, 1994), further suggesting individuals are less motivated to behave safely when nonbehavioral measures are taken to reduce their risk of injury. Fuller (2005) added to this theory by suggesting and providing evidence that drivers strive for a constant level of task difficulty, which is tied to the targeted risk level.

Still, there is evidence that nonbehavioral engineering interventions, such as those reviewed above, do still reduce risk, contrary to what this theory might suggest. For example, while drivers respond to the installation of road lighting with higher speeds and decreased concentration, accident rates are still lower after these safety measures are introduced (Jorgensen & Pedersen, 2002). Seat belt use has also been associated with reductions in accident fatalities, despite increases in risky driver behavior (Reinhardt-Rutland, 2001). Stetzer and Hofmann (1996) found that while drivers may compensate for decreases in environmental risk with riskier behavior, they do not typically compensate enough so as to return the overall risk to previous levels. This is consistent with the aforementioned findings above on street lighting and seat-belts, which may increase risk-taking but still decrease overall accident rates and/or severity. Others have specifically critiqued the risk homeostasis theory and its conclusions about safety interventions, noting, among other things, the extent to which nonmotivational safety measures have reduced accident rates (Graham, 1982) and the difficulty in aggregating the model across situations (Cole & Whitney, 1982).

Despite these conflicting findings, risk homeostasis theory has been very influential in safety research, given how widely cited Wilde's (1982) article has been, and has provided a psychological explanation for some counterintuitive findings about safety interventions. It also presents the most widely researched theory of safety motivation that, like control theory in general, uses feedback loops as the basis for safety motivation. Finally, risk homeostasis theory is important in its emphasis on the value placed on safety and the importance of increasing an individual's targeted risk level when implementing safety interventions. It points to the importance of taking behavioral and motivational measures, in addition to engineering measures, to increase safety.

As this review of risk homeostasis theory suggests, research using this approach has almost exclusively focused on self-protective behavior with immediate consequences for oneself. Its primary implications are that individuals are most motivated to act safely when they perceive a discrepancy between actual and target risk levels and when they place a high value on safety. However research using this approach to safety has ignored

behaviors with delayed outcomes and outcomes that impact the safety of others. Furthermore, this theory says little about when individuals in organizations attempt to take some control of and change their level of risk by modifying their work environment. Nonetheless, risk homeostasis theory and control theory in general point to the purposeful nature of safety-related behaviors, suggest these behaviors are performed when they are identified with the resolution of goal-feedback discrepancies. Furthermore, these approaches suggest that safety behavior at work is in part guided by values and principal goals of safety and security.

Social-Cognitive Approaches

Social-cognitive theories of motivation, including goal-setting theory or goal theory (Locke, Shaw, Saari, & Latham, 1981), expectancy theory (Vroom, 1964), and self-efficacy theory (Bandura, 1997), have significant fundamental and philosophical differences with control theory. While control theory describes behavior as a reaction to goal-feedback discrepancies, social-cognitive theorists suggest the mind is more proactive and anticipatory. More specifically, social-cognitive theories propose that individuals hold self-efficacy beliefs about their own behavior, actively set their own goals, and engage in self-evaluation and ultimately self-reaction (Bandura, 1986). Bandura (2001), in his review of social-cognitive theory, stated, "To make their way successfully through a complex world full of challenges and hazards, people have to make good judgments about their capabilities, anticipate the probable effects of different events and courses of action, size sociostructural opportunities and constraints, and regulate their behavior accordingly (p. 3)."

The line of research supporting social-cognitive approaches to motivation is extensive and a full review is beyond the scope of this paper. In summary, it is based on the notion of human agency, or the intentionality of human behavior (Bandura, 1989). Intentions are representations of future courses of action. Individuals have the ability to think ahead and create action plans, resulting in self-set goals. Foreseeable future events are mentally represented and become regulators of current behavior through the development of expectancies for behavior. Perhaps the most influential approach to motivation based on the notion of foreseeable future events is Vroom's (1964) expectancy theory, which specifies motivational force as a function of three factors: expectancy, instrumentality, and valence. Expectancy is the perceived relation between effort and performance, instrumentality is the perceived relation between performance and relevant outcomes, and valence is the subjective value of those outcomes. Each of these factors has been found to individually predict effort and performance at work (Van Eerde & Thierry, 1996).

Goal theory has also been developed as a social-cognitive approach to motivation. According to goal theory, goal-setting focuses attention and action towards goal attainment, leads to greater effort and persistence, and facilitates the development of strategies to meet goals (Locke, Shaw, Saari, & Latham, 1981). Goal-setting draws from the self-reactiveness of humans (Bandura, 2001). Self-reaction refers to the process of humans regulating their behavior in reference to goal states. This regulation involves the evaluation and adjustment of behavior to keep one on goal trajectories. Goals specify the standards that must be met for positive self-evaluation, further creating motivational force

(Bandura, 1989). One of the key differences between control theory and social-cognitive theory is in how goals are formed. Under control theory, goals are a function of higher-order goal-feedback discrepancies and motivation is based on discrepancy reduction. In contrast, under social-cognitive theory, motivation is based on discrepancy reduction *and* production, meaning that individuals try to eliminate discrepancies between their performance and their performance goals, while they also sometimes set higher goals once those goals are met. This notion has been supported by findings that, after meeting certain task goals, individuals intentionally create discrepancies by setting higher goals (Phillips, Hollenbeck, & Ilgen, 1996).

Another key component to social-cognitive theory is self-efficacy. Self-efficacy is the belief individuals have in their ability to mobilize the cognitive resources and carry out actions required to meet situational demands (Bandura, 1982). A meta-analysis of self-efficacy found that it was moderately correlated with work-related criteria (Stajkovic & Luthans, 1998). This correlation was much higher for tasks of low complexity than of high complexity. As with goal-setting, the literature from the past 25 years supporting the relationship between self-efficacy and performance is extensive. Still, self-efficacy has been a point of contention between social-cognitive and control theorists. Recent findings from intraindividual studies have shown some negative effects of self-efficacy in learning contexts, suggesting that when self-efficacy is high individuals do not perceive a discrepancy in their ability level and therefore devote resources to other tasks (Vancouver & Kendall, 2006; Vancouver, Thompson, & Tischner, 2002). Vancouver and colleagues (2002, 2006) have also contended that self-efficacy is confounded with ability and that self-efficacy may have detrimental effects on within-individual performance, particularly in training situations.

Just as social-cognitive theories differ from control theories in their approach to human motivation in general, social-cognitive approaches to safety motivation differ from those using a control theory framework (e.g., risk homeostasis) in that they focus on expectancies for behaviors and behavioral intentions as the causes of subsequent safety-related behavior. Under this view, individuals anticipate the outcomes of behavior and make choices based on those anticipated outcomes. Most social-cognitive approaches to safety motivation stem from the health behavior literature.

The most common social-cognitive approaches to health behavior are expectancy-value models, which view intentional safety behavior as a function of the expected outcomes of safety-related behavior and the value placed on those outcomes. Examples of expectancy-value approaches include the Health Belief Model (Becker, 1974), Protection Motivation Theory (Rogers, 1983), and the Theory of Planned Behavior (Ajzen, 1991). The Health Belief Model suggests that safety-related behavior is based on the perceived susceptibility to injury or illness, severity of the potential injury or illness, and perceived benefits of and barriers to safe action. It has been used to predict several types of health-related behavior including, in recent studies, testicular self-examinations (McClenahan et al., 2007), physical activity (Kiviniemi, Voss-Humk, & Seifert, 2007), and sexual behavior (Lin, Simoni, & Zemon, 2005). The Theory of Planned Behavior includes perceived norms, attitudes, and self-efficacy as predictors of health-related behavior. These factors have been found to predict a variety of health and safety-related

behaviors such as adolescent smoking (Guo et al., 2007) and the intent of pedestrians to cross streets in busy situations (Holland & Hill, 2007). Protection Motivation Theory suggests that individuals form a threat appraisal and a coping appraisal when deciding whether or not to protect themselves. They develop a threat appraisal by assessing the likelihood and severity of potential injury and the potential benefits of maladaptive behavior. They form a coping appraisal through the perceived efficacy of an adaptive response (i.e., response efficacy) in reducing the likelihood of injury and one's self-efficacy for performing the response. The threat and coping appraisal combine to determine behavioral intentions. This theory has been used recently to predict health-related behaviors such as exercise (Lippke & Plotnikoff, 2006) and condom use (Boer & Mashamba, 2005).

Whereas these models and theories were developed from expectancy theory and social learning to understand and predict health behavior, they are also applicable to safety motivation and behavior at work and have received empirical support as predictors of safety performance. High threat perceptions have been shown to decrease risky decision-making (Sitkin & Weingart, 1995) and to increase the willingness of employees to participate in safety improvement programs (Goldberg, Dar-El, & Rubin, 1991; Cree & Kelloway, 1997). A meta-analysis of the Protection Motivation Theory found that threat vulnerability, threat severity, response efficacy, and self-efficacy moderately predicted a variety of health behaviors (Floyd, Prentice-Dunn, & Rogers, 2000). Components of Protection Motivation Theory also predicted the use of a hearing protection device in manufacturing workers (Melamed, Rabinowitz, Feiner, Weisberg, & Ribak, 1996). Response efficacy, the belief in a protective action's effectiveness in preventing injury or illness, has been found to be a factor in the decision to take self-protective measures against exposure to pesticides (Vaughan, 1993), was related to adaptive coping in response to the threat of breast cancer (Rippetoe & Rogers, 1987), and predicted health care workers' use of a hoist during patient handling (Rickett, Orbell, & Sheeran, 2006). The perceived costs of safe behavior, such as detrimental effects on performance or comfort, are also strong (negative) predictors of adaptive health behavior (DeJoy, 1996; Janz & Becker, 1984). In one study on blue collar workers' use of a hearing protection device, the costs of and barriers to wearing protective equipment were the strongest predictors of self-reported usage (Lusk, Ronis, & Kerr, 1995).

These studies as a whole suggest that expectancies, mental representations of outcomes of behavior, are significant predictors of safety-related behavior at work. However, social-cognitive theories of self-protective behavior have some drawbacks. Expectancies, the key predictors in social-cognitive models, are unobservable and therefore difficult to study in natural environments. Tests of these theories often involve asking participants about their expectancies and correlating these expectancies with subsequent behavior, raising the possibility that researchers are "creating cognitions" that would not have existed had the questions about expectancies not been asked (Ogden, 2003). Still, social-cognitive perspectives represent an important alternative to control-based theories of self-regulation in that social-cognitive theories describe individuals as actively planning their future behaviors, in contrast to control theories, which describe

humans as primarily reactive to goal-feedback discrepancies. Hence, both approaches are important to consider in developing models of safety motivation.

Despite some philosophical differences, social-cognitive and control theories share one persistent common thread, the purposeful nature of behavior. While they disagree on where goals come from, they both agree that behavior is goal-directed. Control theory and social-cognitive theory have influenced safety motivation theory, and elements of each approach, such as goals and feedback, appear in behavioral safety programs (e.g., Komaki, Collins, & Penn, 1982; Ludwig & Geller, 1997). Risk homeostasis and social-cognitive approaches to safety motivation share the assumption that safety-related behavior is motivated by goals and an individual's perceived status relative to those goals, whether those goals are self-set, represented mentally, and/or a function of higher-order control loops.

However, by focusing primarily on self-protective and task-related behavior, the approaches reviewed have not distinguished motivational bases for behaviors that are associated with outcomes of varying temporal and social distance. Safety-related behaviors at work can have immediate and delayed consequences and can be focused on outcomes for others or just oneself. The purpose of this research is to identify and test distinctions between these types of behaviors and their relations with values, management commitment, and self-regulatory states. See Table 1 for an outline of the proposed differences in the motives for behaviors that vary along these dimensions.

Proposed Four-Dimensional Structure for Safety Performance

Given that current theories of motivation describe behaviors as goal-directed, the structure of safety behavior at work may be guided by the goals of those behaviors. In this paper I am proposing that behavioral goals vary along two dimensions that have implications for safety motivation: temporal focus of the safety behaviors and the extent to which the behaviors are focused on others and the work environment as a whole. In other words, some behaviors have the goal of increasing safety immediately, whereas others behaviors have the goal of improving safety in the future. I label these *present-focused* and *future-focused* behaviors, respectively. Similarly, some behaviors are performed in order to achieve one's own safety, while some behaviors are aimed at the safety of others and the work environment as a whole. I label these *self-focused* and *other-focused*, respectively. Fully crossed, this two-dimensional structure specifies four types of safety-related behaviors: Those that impact oneself immediately, those that impact oneself with delayed outcomes, those that impact others immediately, and those that impact others with delayed outcomes. See Table 2 for a layout of this proposed structure, which provides examples of these four types of behaviors.

The first dimension along which I propose that the outcomes of safety behaviors vary is in how much time is expected to pass between the behaviors and their intended results. Self-regulatory approaches to safety, as reviewed above, assume that safety-related behaviors are goal-directed. However, existing explanatory models of safety behavior do not specify the timing of the outcomes of behavior as a dimension that impacts the motives for those behaviors. At one extreme, there are safety behaviors that have immediate consequences and may be a reaction to an experienced risk or near miss. At the other extreme are behaviors which have no immediate impact but which might

have safety outcomes in the distant future. When the goals of the behavior are experienced immediately after the behavior is performed, the behavior is concerned with expected outcomes that are temporally close, and therefore psychologically close. Behaviors that are aimed at preventing accidents in the future have outcomes that are temporally and psychologically distant.

Many behaviors that compose the traditional safety compliance dimension have outcomes that are relatively immediate. For example, wearing protective gear is often instrumental to the immediate goal of avoiding acute hazards. The goal of the behavior, avoiding acute hazards, is immediately experienced and might be attributed to whether one does or does not wear protective gear. However, other task safety behaviors may be aimed at longer-term well-being. For example, wearing a hearing protection device, which can prevent exposure of the hearing organs to large explosions that could cause immediate damage, also can prevent cumulative hearing loss over an extended period of time. These behaviors with delayed-outcomes often do not provide immediate reinforcement and are motivated by anticipated outcomes. Self-protective behavior aimed at the prevention of acute accidents and acute injuries can usually be categorized as immediate in its focus since the factors that lead to such accidents are typically discrete and do not need to accumulate over time. In contrast, self-protective behavior that prevents cumulative injuries or illnesses, such as hearing loss or back ailments, has a longer-term impact but does not usually have safety-related consequences that are as immediate.

Many, although not all, behaviors that compose safety participation or safety citizenship as defined by Hofmann et al. (2003) and Griffin and Neal (2000) have more of a long-term than a short-term focus. For example, participating in health and safety committees and reporting the existence of hazards to appropriate authorities usually do not immediately impact the safety of the work environment. These behaviors work toward long-term improvement but may have little safety-related reinforcement. There are exceptions to this generalization such as informing a coworker on how to perform a task safely. This is categorized as a citizenship behavior in Hofmann et al.'s work but might have immediate consequences for the coworker's safety.

This distinction between present- and future-focused behaviors is an important addition to the safety behavior literature, given that proactive behaviors can play a key role in preventing some of the systemic and distal causes of accidents, even though their effects are not immediately experienced. Little attention in the occupational safety motivation research has been given to proactive safety behaviors, which have more temporally distant and ambiguous outcomes than reactive behaviors. Proactive safety and health behaviors, however, have received attention in other domains. For example, Norris (1997) looked at precautionary behaviors at home such as advance storm planning, accumulating basic supplies, having a smoke alarm, and checking automobile lights, brakes, and tires regularly. In stress coping research, Aspinwall and Taylor (1997) discussed proactive coping as a process through which individuals anticipate or detect potential stressors and act to prevent them. Proactive coping in this sense involves resource accumulation, recognition of potential stressors, initial appraisal, preliminary coping efforts, and elicitation and use of feedback. Occupational safety behaviors can

also take this form in anticipation of potential accidents, hazards, or environmental conditions in the future and taking action in response to this foresight.

As noted in social-cognitive theories of safety motivation, expected outcomes of safe behavior, both positive and negative, are key predictors of whether employees engage in self-protective behavior. In terms of dealing with acute hazards, self-protective behaviors usually have foreseeable and temporally close safety outcomes; these are more immediate than for future-focused behaviors. This distinction has been noted in the literature on OCBs. In one study, Joireman and colleagues (2006) discussed OCB as a social dilemma in which the short-term employee sacrifice leads to long-term organizational benefits. They found that those who had adopted a longer-term horizon within the organization were more likely to engage in OCBs. This distinction may also be relevant for the performance of future-focused safety behaviors, where individuals exert effort for little short-term gain, but potentially high long-term gain.

The second dimension along which I propose that safety behaviors in organizations vary is the extent to which behaviors are focused the safety of others and the worksite as a whole. In other words, these behaviors vary in the extent to which they are *self-focused* or *other-focused*. Certain behaviors such as wearing protective equipment and avoiding risks are concerned primarily with one's own safety. These behaviors are the focus of most theories on health and safety behavior such as Protection Motivation Theory (Rogers, 1983) and the Health Belief Model (Becker, 1974). Other behaviors, such as participating in health and safety committees and informing coworkers when they are performing tasks unsafely, are intended to improve the safety of others and of the work environment as a whole. These behaviors have received little attention in the safety motivation literature. There are some exceptions to this general omission in the literature. Geller, Roberts, and Gilmore (1996) discussed some of these behaviors, which they labeled "actively caring" behaviors, defined as behaviors where employees are acting to benefit the safety of other employees. Examples of items used to measure "Actively caring" were, "If I know a coworker is going to do a hazardous job, I am willing to remind him/her of the hazards," and "I feel comfortable praising my coworkers for working safely."

Similar concepts have appeared in the job performance literature, stemming from Organ's (1988) concept of organizational citizenship behaviors. These include employee altruism (Organ, 1988), interpersonal citizenship behavior (Settoon & Mossholder, 2002) and helping behavior (LePine & Van Dyne, 2001b). LePine and Van Dyne (2001b) identified four types of behaviors intended to help a work group in response to low performers: compensating for, training, motivating, and rejecting the low performer. The first three of these could be easily translated into safety-related behaviors. One could compensate for an unsafe performer by picking up his/her slack in the adherence to safety precautions. One could also instruct an unsafe performer how to perform tasks more safely (i.e., train) or attempt to persuade the unsafe performer to perform more safely by informing him/her of the dangers involved (i.e., motivating). In addition, one could praise others who are performing tasks safely and encourage them to continue their safe performance.

The temporal distance and self-other dimensions both reflect the psychological distance of the intended outcomes of safety behaviors. Using this framework, behaviors with the most psychologically close outcomes are those that impact oneself immediately, whereas those that are the most psychologically distant are those that impact others and have delayed outcomes. Behaviors that impact others immediately or impact oneself in the future have a moderate level of psychological distance relative to the two extremes. The temporal and social distance are likely related, as outcomes that impact others are probably more likely to be temporally distant than outcomes that just impact oneself. There are some exceptions to this, such as self-focused behaviors that prevent cumulative injury and other-focused behaviors that lead the work group to avoid acute hazards; these are located in the off-diagonal cells of Table 2.

This four dimensional structure is an alternative to the two-dimensional, compliance-participation structure proposed in the literature, which stems from the general task-contextual performance distinctions. This organizing framework may be more useful than the task-contextual safety performance distinction in understanding occupational safety motivation. The task-contextual distinction in safety performance has been proposed and validated based on intercorrelations between the performance ratings of the behaviors, not by characteristics of the behavioral outcomes themselves. Yet, theory and research on work motivation has provided extensive rational and empirical evidence that behaviors are outcome-driven. Focusing on characteristics of the expected outcomes of safety behaviors in developing safety behavior factors, motivational bases for the behaviors can be mapped directly on to the behavioral factors. This may be more effective than using the distinction between in-role and extra-role or between task and contextual behaviors as a proxy for differences in the expected outcomes of actual behaviors. Hence, the distinctions provided here may be more relevant than the previous distinctions in developing a more differentiated understanding of occupational safety motivation.

> H1: Safety behaviors can be reliably categorized into four types: present/self focused, present/other-focused, future/self-focused, and future/other-focused.

The two dimensions along which safety behavior outcomes are proposed to vary share one common dimension: the psychological distance of their outcomes. The See Table 3 for a list of proposed distinctions between psychologically close and psychologically distant safety behaviors. Psychologically close behaviors are those that concern one's own safety, are of immediate consequence, have relatively concrete outcomes, and are focused on maintenance of the current state. Behaviors that focus on psychologically distant outcomes have outcomes that are more difficult to envision, involve individuals taking an active role in influencing their work environment, and have consequences that are less certain. Behaviors that focus on psychologically close outcomes may also receive more priority, on average than those with psychologically distant outcomes, as control theories suggest that the goals that are most salient tend to receive the greatest attention, Goals that are psychologically close are likely to be the more salient than those that are psychologically distant.

I propose that there are three primary differences between psychologically close and distant behaviors that have implications for their performance. These propositions

build on and in some cases deviate from current theories of workplace safety motivation. First, as reviewed in more detail below, there is evidence that psychologically distant events are construed in a more abstract and decontextualized manner and are identified more by their purpose than by their specifics. This may increase the role of goals in the performance of behaviors that are aimed at psychologically distant outcomes. Second, psychologically distant outcomes are likely to have a lower intrinsic value than psychologically close outcomes. This diminished value may increase the role of alternative environmental reinforcers or extrinsic motives, such as perceptions of management commitment to safety, in their performance. Finally, behaviors that aim to influence psychologically distant outcomes may entail different psychological states such as empowerment, promotion focus, and organizational identification that lead one to seek to influence and improve oneself and the work environment. This is in contrast to safety behaviors focused on psychologically close outcomes, which are motivated by a desire to maintain stability and avoid catastrophe and may not be driven by these psychological states.

Construal Level and Value Theory

The first key difference I propose between psychologically close and psychologically distant outcomes is the nature of their construal. If behaviors are fundamentally driven by perceived outcomes, as social-cognitive theories suggest, differences in how these outcomes are construed may have implications for motivation towards these outcomes. Construal level theory (Trope & Liberman, 2003) provides a framework to understand these different mental representations. According to construal level theory, people develop models of events at different levels of abstraction. High level construals are abstract, simple, structured, decontextualized, and superordinate. Low level construals, in contrast, are complex, concrete, and context-specific. High level construals are characterized by a few general, prototypical features, while low-level construals are more detailed in their differentiation of categories and contingencies. Trope and Liberman (2003) describe this as analogous to viewing a picture from two different physical distances. At a far distance, you see a big picture as a whole, while at a closer distance you see more specific features of the picture. Actions can be identified at different levels of construal. Vallacher and Wegner's (1987) Action Identification Theory, as discussed earlier, suggests that actions can be identified in terms of lower-order and/or higher-order goals. Lower-order goals refer to the specifics or the "how" of the actions, while higher-order goals refer to the purpose or the "why" of the actions (also see DeShon & Gillespie, 2005). For example, the action "conducting a study" would be considered as "advancing science" at a higher-level of construal or identification, while it would be seen as "testing hypotheses" at a lower level.

There is a growing body of research showing that individuals develop higher-level construals of more distant events and lower-level construals of near events, and that these construals impact action preferences. Decisions with respect to distal outcomes have been shown to be more related to higher-order personal goals, while those with respect to outcomes that are near are more motivated by temporary affective goals (e.g., increasing ones mood); these findings reflect that the value placed on high-level construals is more positively related to the attractiveness of future actions, while the

value placed on lower-level construals is more positively related to the attractiveness of immediate actions (Trope & Liberman, 2000). For example, studying in the library, which has a stronger higher-order goal and purpose but less immediate specific outcomes, is seen as a more attractive option in the distant than the near future, while eating unhealthy food, which does not help one achieve higher-order goals but does achieve specific desires, is a more attractive option in the near than distant future. Fujita and colleagues (2006) found that high-level construals resulted in decreased preferences for immediate as opposed to delayed outcomes, suggesting that individuals have a higher level of self control under high-level construals. Furthermore, they showed that simply priming a high construal level increases the perceived value of temporally distant outcomes, while priming a low construal level increases the value of temporally near outcomes.

Temporal distance also impacts judgment. Nussbaum, Liberman, and Trope (2006) showed that in predicting distant future events, individuals relied on more abstract, decontextualized information, while in predicting events in the near future, individuals focused on specific aspects of the task. For example, subjects in Nussbaum et al.'s (2006) study thought that psychological theories were better predictors of behavior and that abilities were better predictors of test performance in the distant than the near future. In contrast, they thought that specific aspects of a test such as question format were better predictors of test performance in the near than the distant future. It has also been shown that individuals have higher fate judgments for temporally distant than temporally close events, suggesting that individuals believe they have less control over temporally distant outcomes than temporally close outcomes (Burres & Roes, 2006).

What are the implications of construal level theory for safety behaviors with varying degrees of temporal focus? Construal level theory suggests that employees develop different mental representations and mental models for the potential outcomes of future-focused behaviors than for present-focused behaviors. These mental representations are a key driver of behavior, according to social-cognitive theories of safety. Behaviors that are associated with outcomes such as changes to work procedures, the removal of hazards, and the prevention of future accidents, none of which reflect immediate outcomes, may be driven by construals that are of a higher level than behaviors associated with immediate outcomes such as performing work tasks safely.

Given that distant events tend to be construed at a higher, more abstract level (Trope & Liberman, 2003), values and higher-order goals may be a stronger predictor of future-focused safety behaviors than present-focused behaviors. Values and higher-order goals are not specific to a situation and influence behavior by guiding personal goals. According to Schwartz (1992), values represent the ideals that are used to organize goals. Lewin (1952; as cited in Verplanken & Holland, 2002) stated that values influence behavior by "inducing" force fields, or goals. Similarly, Verplanken and Holland (2002) took the view that values are "cognitions that may define a situation, elicit goals, and guide action (p. 435)." Taking these perspectives, goals are guided by values, and in turn specify the "why" of specific actions (Deshon & Gillespie, 2005).

Individuals who engage in future-focused safety behaviors, according to construal level theory (Trope & Liberman, 2003), are more likely to represent future outcomes of

their behavior in abstract terms guided by higher-order principle goals and/or values of safety and security. These higher-order principle goals are not context-dependent; rather they reflect goals that are likely to cover different work behaviors. More broadly, future-oriented behaviors are identified by their purpose or "why" characteristics, while present-oriented behaviors are identified by their procedures, or "how" characteristics (Trope & Liberman, 2003). Hence, future-oriented safety behaviors are likely to be identified with principle goals and values, whereas present-oriented safety behaviors are likely to be identified with short-term, lower-order goals and task-specific beliefs about how to avoid a specific hazard.

Safety and physical health are principle goals that may have implications for safety behaviors; this may be especially the case for future-oriented safety behaviors. These goals are probably in part be derived from security values, which are based on the basic need of an organism to survive and maintain its integrity (Schwartz, 1987). Safety and physical health goals reflect an importance placed on bodily integrity, safety, health, and the absence of illness (Grouzet et al., 2005). Grouzet et al. (2005) found that safety and physical goals were organized similarly across 15 cultures, suggesting that they are relatively universal in their structure while varying in importance across individuals and situations.

Safety and physical health goals guide behavior should result in behaviors that enhance physical health and safety. The relationship between these goals and corresponding behavior may be more likely when the behavioral outcomes are construed at a higher, abstract level since, as noted by Trope and Liberman (2003), actions with outcomes at high construal levels tend to be more driven by their purpose than actions at low construal levels. These higher levels of construal are more likely for temporally distant outcomes (Trope & Liberman, 2003). Therefore safety and physical health goals may be positively related to all types of safety behaviors. Furthermore, future-focused safety behaviors may be more positively related to safety and physical health goals than present-focused safety behaviors, which have been shown to be predicted by more context-specific expectancies (e.g., Melamed et al., 1996).

H2a: Safety and physical health goals are positively related to the performance of all four types of safety behaviors.

H2b: The relationship between safety and physical health goals and the performance of future-focused safety behaviors (self and other-focused) is stronger than the relationship between safety and physical health goals and the performance of present-focused safety behaviors (self and other-focused).

Trope and Liberman (2003) discussed extensions of their findings with respect to temporal construal, which has direct implications for future-focused safety behaviors, to other types of psychological distance. Research supported extensions of construal level theory to social distance (Bar-Anan, Liberman, & Trope, 2006) and spatial distance (Fujita, Henderson, Eng, Trope, & Liberman, 2006; Henderson, Fujita, Trope, & Liberman, 2006), although this research has not been applied to organizational settings (nor have those on temporal distance). Like temporal distance, as discussed above, social distance reflects a type of psychological distance that may have implications for construal of events and motives for behavior. As stated, psychological distance (Lewin, 1951) can

be treated as the location of outcomes or events in one's "life space." Events that are farther away in time are more distant in one's life space. Similarly, events that concern others are more distant in one's life space than those that concern the self.

Trope and Liberman (2003) and Bar-Anan, Liberman, and Trope (2006) suggest that principles of temporal construal may also apply to social distance. There are findings supporting this notion. A long line of research has shown that people tend to attribute the behavior of others to dispositions, while they attribute their own behavior to the specifics of the situation (Heider, 1944; Jones, 1979; Robins, Spranca, Mendelsohn, 1996). People also tend to view out-groups as more homogenous and in more abstract terms, while viewing in-groups as more differentiated and in more concrete terms (Park, Ryan, & Judd, 1992). In a study looking at the effects of power on information processing, Smith and Trope (2006) found that individuals who were primed by power situations were more likely to process information in an abstract manner and to identify actions by their purpose rather than by their procedures. Those who were power-primed also demonstrated evidence of greater activation of the right hemisphere of the brain, which is associated with more global information processing. Smith and Trope interpreted these findings as evidence that power increased the psychological (primarily social) distance from the subject matter the subjects were examining. Individuals therefore may be more likely to abstractly process and represent outcomes concerning coworkers than information about themselves because others are more psychologically distant. In summary, the literature suggests that socially distant mental representations, like temporally distant representations, are more holistic, less differentiated, and place a greater emphasis on "why" rather than "how" aspects of the situation. An implication of these findings might be that other-focused behaviors, like future-focused behaviors, are more purpose-driven than self-focused behaviors.

Since other-focused safety behaviors have outcomes that are more psychologically distant, they may be more driven by goals than self-focused safety behaviors. As with future-focused behaviors, other-focused behaviors may have more uncertainty associated with their outcomes. Individuals may perceive themselves as having less control over how safety behaviors impact others than how they impact themselves. For example, one may not know if helping someone else perform tasks safely or voicing concerns to management about safety issues will impact the safety of others. In contrast, one may be more confident in judgments about how protective gear impacts their personal safety. Therefore, in deciding when to engage in other-focused safety behaviors, individuals may hold more abstract representations of expected outcomes and draw from higher-order goals when deciding how to behave. Self-focused behaviors, in contrast, have outcomes that might be viewed as more concrete and situation-specific, especially when one has more perceived control over the outcomes. Therefore, instrumentality beliefs may be more reliable sources of information for and better predictors of self-focused than other-focused behaviors.

Goals related to community and affiliation may be particularly important for other-focused behaviors. These goals reflect collectivist values and indicate a desire to improve the world through generativity and have satisfying relationships with others. Schwartz and Bilsky (1987, p. 552), in attempting to develop a unified structure of

human values, noted that "a positive, active concern for the welfare of others is also necessary for collectivities to thrive." Schwartz and Bilsky (1987) defined prosocial and restrictive conformity dimensions as part of an overall collective value structure. They found that these values also differ across cultures along an individualist-collectivist dimension (Schwartz & Bilsky, 1990) and later reduced their overall value structure to two dimensions, one being collectivism-individualism. Grouzet and colleagues, through multidimensional scaling, found results across 15 cultures suggesting that community and affiliation goals, like those for health and safety, are organized similarly by individuals throughout the world. In a series of studies, Verplanken and Holland (2002) demonstrated that values such as these are stronger predictors of behavior when they are primed or activated, demonstrating that there may be situational effects on the activation of community and affiliation goals in the workplace. It is proposed here that community and affiliation goals predict the performance of other-focused safety behaviors because of the focus of these behaviors on improving the safety of others and the work group as a whole. In addition, since construal levels may be more abstract for other-focused than self-focused outcomes, community and affiliation goals may be stronger predictors of other-focused than self-focused behaviors.

> H3a: Community and affiliation goals are positively related to the performance of other-focused safety behaviors (present and future-focused).

In addition, there is no theoretical or rational basis for a relationship between community and affiliation goals and self-focused behaviors. Therefore, it is expected that these goals are more strongly related to other-focused than self-focused behaviors.

> H3b: Community and affiliation goals are stronger positive predictors of the performance of other-focused than self-focused safety behaviors (present and future-focused).

Management Commitment

Behaviors with psychologically distant outcomes may also have a lower intrinsic value than those with psychologically close outcomes. There is evidence that individuals place greater value on outcomes when they are more immediate than when they are temporally distant (Steel & Konig, 2006). It is also likely that individuals will tend to value self-relevant outcomes more than outcomes relevant for others. Given that the outcomes of future-focused and other-focused behaviors may have less intrinsic value to the behavioral operant, reinforcement from others and extrinsic rewards that are attached to these behaviors may be increasingly important in the performance of these behaviors. Management can provide this type of reinforcement. Therefore, management commitment to safety may play a greater role in the performance of these psychologically distant behaviors.

The impact of time on the representation of future events and the relative utility of competing choices has been discussed in the self-regulation and decision-making literature. The theory of hyperbolic discounting suggests that the value of outcomes decreases as they become more delayed (Loewenstein & Elster, 1992). This decrease per unit of time becomes progressively less the farther into the future that the outcomes are perceived to occur, following an asymptotic pattern. Temporal Motivation Theory (TMT), recently proposed by Steel and Konig (2006), integrates hyperbolic discounting

theory with expectancy theory. According to TMT, expected utility is a function of the product of valence and instrumentality, as specified in expectancy theory (Vroom, 1964), but then must be divided by the difference between the current time and the time that the outcome is expected. As a result, the forces that impact behavior according to expectancy theory, particularly efficacy and instrumentality, are attenuated by the temporal distance from the expected outcome, which decreases the outcome's intrinsic value.

The discounting of delayed outcomes, which has been used to explain a variety of maladaptive behaviors where individuals fail to take actions that have delayed outcomes, may be useful for understanding motivation for the performance of future-focused safety behaviors. Behaviors explained by the discounting of delayed outcomes include impulsive cocaine use (Coffey, Gudleski, Saladin, & Brady, 2003), failure to save for retirement (O'Donoghue & Rabin, 1999), general procrastination (Steel, 2007), and smoking (Reynolds et al., 2007). These studies suggest that when people underweight the value of future outcomes relative to those that are immediate, they engage in impulsive behavior with short-term gains while neglecting behaviors that have delayed benefits. Given that future safety outcomes may be perceived as less desirable and important than immediate safety outcomes, the outcomes associated with future-focused safety behaviors may have less expected utility than those associated with present-oriented actions. In other words, the reinforcement value of future safety outcomes for the task itself is likely to be lower than the reinforcement value for immediate safety outcomes.

If future-focused behaviors are by default seen as less likely to result in their intended safety outcomes and those outcomes are less valued due to their temporal distance, reinforcers unrelated to safety may be more important for future-focused safety behaviors than for present-focused behaviors. Management commitment to safety is an alternative reinforcer in the performance of safety behaviors. Support and reinforcement from management is a key factor in most models of safety climate (Zohar, 1980). Management commitment can attach immediate nonsafety outcomes (e.g., management approval) to future-focused behaviors which have few if any immediate safety outcomes. For example, managers can give praise to employees who perform safely and show disapproval of unsafe practices. They can also reward behaviors that take away from safety, such as the speeding up of work practices.

Perceptions of management commitment to safety may be a stronger predictor of future-focused than present-focused safety behaviors. Present-focused behaviors have more salient and valued safety outcomes, which increases the safety-specific motives for these behaviors. For example, the safety-driven motivation for wearing protective eye goggles (a present-focused behavior) is likely to be greater on average than the safety-driven motivation for participating in health and safety committees (a future-focused behavior), since the outcomes of the former are by default more highly valued than those of the latter, according to theories on delayed discounting. This is not to say there is no safety-related motivation for future-oriented behaviors, but rather to say that alternative reinforcers, particularly management commitment to safety, are more important in the performance of future-oriented than present-oriented behaviors.

Whereas the difference in the value of expected outcomes of future-focused relative to present-focused behaviors is explained by hyperbolic discounting of future outcomes, other-focused safety behaviors are also likely in general to have lower value than self-focused safety behaviors. This is based on the basic notion that individuals are first driven by their own safety needs, and secondarily by the need to help others. Hence, it is expected that perceptions of management commitment to safety have a similar impact on other-focused behaviors as on future-focused behaviors. They serve as an alternative reinforcer with a stronger effect on behaviors that have psychologically distant and less valued outcomes. .

In summary, it is expected that behaviors with psychologically distant outcomes, either future-focused or other-focused (or both), are more strongly related to perceptions of management commitment to safety than behaviors with the least amount of psychological distance associated with them (i.e., present- and self-focused).

H4a: Perceptions of management commitment to safety are positively related to the performance of all four types of safety behaviors.

H4b: The relationship between perceptions of management commitment to safety and the performance of future/self-focused, future/other-focused, and present/other-focused behaviors is stronger than the relationship between perceptions of management commitment to safety and the performance of present/self-focused behaviors.

Psychological States

Two key differences have been proposed between psychological close and psychological distant safety behaviors. First, psychologically distant events are construed differently than psychologically close events, increasing the relevance of principles goals in their performance. Second, psychologically distant outcomes have less value than psychologically close outcomes, increasing the importance of perceptions of management commitment in the performance of behaviors aimed at these outcomes. The third and final difference that I propose between these types of safety behaviors is in the extent to which specific psychological states, particularly psychological empowerment, regulatory focus, and organizational identification, predict their performance. Behaviors with immediate, self-relevant safety outcomes are more likely to be reactions to experienced events and are often focused on maintaining the current state of affairs. In contrast, behaviors aimed at influencing others, the work environment, and the future entail an orientation towards taking control of, changing, and advancing oneself and the work environment. I hypothesize that this increases the relevance of psychological empowerment, a promotion regulatory focus, and organizational identification in the performance of future-focused and other-focused behaviors.

Empowerment is one psychological state that may have a greater influence on psychologically distant safety behaviors than psychological close safety behaviors. Future- and other-focused safety behaviors are more likely to be concerned with changing the work environment than present-focused safety behaviors. Individuals can take part in changing the work environment, but most environmental changes take time to occur, delaying the outcomes of those behaviors. These include behaviors such as reporting accidents and hazards, participating in committees, and voicing safety-related concerns to

management. However, most research on employee safety performance and motivation has focused on behaviors that are intended to maintain a certain level of safety. The theory of risk homeostasis (Wilde, 1982) considers these behaviors exclusively in proposing that individuals compare their risk level to that of a referent standard and adjust their behavior accordingly. Employees also can engage in future-oriented behaviors that change the level of risk imposed by the environment and work procedures. Behaviors that initiate these changes may be just as crucial to organizational safety issues as those that involve risk avoidance, since it is partially through change-oriented behaviors that organizations can remove errors at a systemic and environmental level (Reason, 1990).

As stated, one construct that might contribute to future- and other-focused safety behavior is employee empowerment. Research on empowerment has taken two general perspectives: psychological empowerment and structural empowerment. Spreitzer (1995) defined psychological empowerment as a motivational variable manifested in four cognitions that had been established in previous research: meaning, competence, self-determination, and impact. Meaning refers to the value of a work goal or purpose (Thomas & Velthouse, 1990). Competence is one's belief in one's own ability to perform activities and is synonymous with self-efficacy (Bandura, 1982) in the work context, except that it is generalized and not task-specific. Self-determination is one's belief that one has a choice to initiate one's own actions (Deci, Connell, & Ryan, 1989). Impact is the extent to which a person can impact strategic, administrative, or operating outcomes at work (Ashforth, 1989). These characteristics reflect an active work role orientation such that employees perceive they are able to shape their work context. Spreitzer (1995) found that empowerment, as a single higher-order factor composed of the 4 separate lower-order factors, was significantly related to innovation and managerial effectiveness.

In addition to psychological empowerment, others have noted that empowerment also encompasses structural characteristics, such as the actual distribution of power in an organization. Wilkinson (1998) described empowerment in the form of information sharing, both upward and downward in the organizational hierarchy. He also included employee involvement in organizational decisions, task autonomy, and self-management as components of employee empowerment. Laschinger and colleagues (2004) made the distinction between what they called "structural empowerment" and psychological empowerment. Structural empowerment referred to perceptions of the presence of empowering conditions in the workplace, including formal and informal power, and "perceived access to work empowerment structures of opportunity, information, support, and resources (p. 533)." Psychological empowerment was described by Laschinger and colleagues (2004) as the psychological interpretation or reaction of employees to these empowering conditions.

In an attempt to integrate these perspectives, Matthews, Diaz, and Cole (2003) identified three conditions that increase the likelihood of employee empowerment. The first, a dynamic structural framework, occurs when the organization provides clear and modifiable guidelines that help employees make procedural and behavioral decisions in changing work environments. The second factor is the control of workplace decisions,

which is characterized by employees having input into all aspects of their work life and career. The third factor is fluidity of information sharing, which occurs when information is accessible to all company employees.

Research has found that psychological empowerment is related to several work-related criteria. These include innovation (Spreitzer, 1995), organizational citizenship behaviors and creativity (Alge, Ballinger, Tangirala, & Oakley, 2006), ill-health (2005), organizational commitment (Avolio, Zhu, & Koh, 2004), and job satisfaction (Laschinger, Finegan, Shamian, & Wilk, 2004). Psychological empowerment has also been found to be related to change-oriented leadership behavior, including innovation and upward influence (Spreitzer, de Janasz, & Quinn, 1999). Less research has been conducted on structural empowerment (e.g., power distribution, information sharing). Laschinger and colleagues (2004) found that structural empowerment was related to psychological empowerment and job satisfaction. Patrick and Laschinger (2006) also found structural empowerment was related to role satisfaction and perceived organizational support among nurses.

This study, which is concerned with individual-level motivational predictors of safety performance, specifically focuses on psychological empowerment. There has not been much research looking at psychological empowerment with respect to safety. Perhaps one reason for this has been that most safety motivation research has focused on present- and self-focused behaviors. One study conducted by Mullen (2005) looked at the willingness of employees to raise safety issues. In a cross-sectional survey Mullen found that those with perceptions of "top management openness" were more likely to perceive that top management would pay attention to a safety issue and in turn were more willing to invest time, energy, and effort in identifying safety issues. Hofmann and colleagues (2003) found that the quality of one's leader-member exchange relationship was positively related to safety citizenship behaviors only when shared perceptions of the organization's policies, practices, and procedures reflected a priority for safety (i.e., there was a strong positive safety climate). These leader-member relationships may have resulted in greater information sharing and access to empowerment structures, resulting in structural and psychological empowerment. However, inferences with respect to empowerment and safety are rational and not empirical at this point.

It is expected that those who see themselves as having power within the organization and believe in their ability to initiate safety-related changes (i.e., psychological empowerment) will be more likely to engage in future-focused and other-focused behaviors. These individuals will be more likely to perceive their behavior as instrumental to group- and organization-level change with respect to safety hazards and procedures. In contrast, empowerment is not expected to be as crucial for behaviors that are self- and immediate-focused, since the outcomes of these safety behaviors (e.g., accident avoidance) do not typically involve significantly changing the work safety environment. Psychological empowerment might also increase the likelihood of future-focused behaviors by facilitating the perception that the outcomes of those behaviors are not as temporally distant. A decrease in outcome delay tends to increase motivation due to the increasing utility of temporally close outcomes (Loewenstein & Elster, 1992). Psychologically empowered employees may view their organization as more ready for

positive change and believe that they have a direct influence on safety policies and practices; they may therefore see their behaviors are more instrumental to outcomes, with those outcomes not as delayed as those for employees who do not feel psychologically empowered.

> H5a: Psychological empowerment is positively related to the performance of self/future-focused, other/future-focused, and other/present-focused safety behaviors.

> H5b: Psychological empowerment is more positively related to the performance of self/future-focused, other/future-focused, and other/present focused safety behaviors than to the performance of immediate/self-focused safety behaviors.

Psychological empowerment is a state that is likely to arise out of perceived management commitment to safety and may explain at least part of the proposed link between management commitment to safety and future-focused behaviors. By showing a commitment to safety, management is placing a priority on something (safety) that impacts the well-being of the employee. This is likely to result in a greater congruence between the requirements of one's work role and the employee's own beliefs and values, assuming they value their own safety. Congruence between one's work role and one's beliefs, values, and behavior has been said to characterize work role meaningfulness (Brief & Nord, 1990), one of the characteristics of empowerment (Spreitzer, 1995). Furthermore, by having managers that are committed to their safety, employees may be motivated to take a more active role in their work environment in order to reciprocate this commitment. When safety is given a priority, employees may see their interests as important to the organization and therefore perceive their interests to have a greater impact on the administrative, strategic, and procedural operating outcomes at work. The perception of the impact one has on the organization is also a key part of employee psychological empowerment (Spreitzer, 1995).

Employees who perceive management as committed to safety may also develop clearer role definitions about safety (Hofmann, Morgeson, & Gerras, 2003) and perceive greater clarity in their manager's behavior and priorities (Zohar & Luria, 2004). These situations may create clearer expectations of employees and reduce their role ambiguity. Role ambiguity has been found to be negatively related to psychological empowerment (Spreitzer, 1996). Management commitment may also be interpreted as support from management, creating a sense of individual competence (Spreitzer, 1996) and breaking down barriers to future- and other-focused safety behaviors by creating an environment where employees feel capable of taking control of the safety of their work environment in the future. Perceptions of management commitment to safety and employee empowerment are hypothesized as key components in making these psychologically distant behaviors more desirable and likely among employees.

> H6: Psychological empowerment partially mediates the relationship between perceived management commitment to safety and the performance of future/self-focused, future/other-focused, and present/other-focused safety performance.

Regulatory focus may also reflect distinct psychological states in the prediction of the performance of safety behaviors with psychologically distant outcomes. Regulatory focus theory proposes that individuals vary in the extent to which they focus on and value

promotion and prevention goals (Higgins, 1997). Needs and goals involving security, safety, and stability are more important under a prevention focus, whereas needs involving gains and progress are more important under a promotion focus. Individuals who base their decisions on maximizing subjective expected pleasure may anticipate greater pleasure with good outcomes and less pain with poor outcomes and exhibit a greater propensity for risk-seeking (Mellers, 2000), given the overestimation of favorable outcome likelihood and underestimation of negative outcome likelihood.

  Higgins' (1997) theory has several implications for how individuals consider the utility of potential outcomes. Prevention focus results in a greater sensitivity than promotion focus to punishments, particularly those that threaten one's security and evoke pain. Those in a promotion focus are more sensitive to rewards and achievement-related goals. As stated above, the key component to motivation in control theory is the discrepancy between current and desired states. Individuals do not always pay close attention to multiple goals and may instead focus on one or two at any given point in time. The discrepancies that are the subject of one's attention are the most likely to result in the mobilization of energy towards reducing those discrepancies. Regulatory focus may impact the extent to which individuals notice and act on goal-feedback discrepancies. This might result in a tendency to act on avoidance goal discrepancies such as risk and safety if one is in a prevention focus, and a tendency to act on achievement and progress goal discrepancies, such as performance, if one is in a promotion focus. Supporting this distinction in a series of lab studies, Forster, Higgins, and Bianco (2003) found that individuals in a promotion focus completed tasks more quickly, while those in a prevention focus were more accurate. Those in a promotion focus also show a risky bias to their decisions (Crowe & Higgins, 1997). These results suggest that individuals in a promotion focus are more driven to increase productivity, an achievement goal, while those in a prevention focus are more motivated to avoid errors and risks, which are goals of avoidance.

  Regulatory focus has also been shown to impact the weight placed on event probabilities and the affective reactions that individuals experience. Those in a prevention focus tend to overweight events with a lower base probability, while those in a promotion focus overweight events with high probabilities (Kluger, Stephan, Ganzach, & Hershkovitz, 2004). Those in a promotion focus are also more motivated by an action's outcomes with respect to satisfaction and excitement and the absence of dejection. In contrast, those in a prevention focus are more motivated by anticipated outcomes of relief and contentment and the absence of agitation and anxiety (Leone, Perugini, & Bagozzi, 2005). In a similar vein, regulatory focus also influences the value placed on anticipated emotions (Higgins, Shah, & Friedman, 1997). Those in a promotion focus are more prone to emotions of cheerfulness or dejection, based on performance with respect to approach-oriented goals. In contrast, those in a prevention focus are more likely to experience emotions of quiescence or agitation. These are primarily based on outcomes with respect to goals of avoidance.

  Recently, regulatory focus has been applied to occupational safety contexts. Wallace and Chen (2006) applied regulatory focus theory to workplace safety in a study of university facility employees and found that group-level safety climate was negatively

related to promotion focus and positively related to prevention focus. Furthermore, promotion focus was positively related to productivity and negatively related to safety performance, while prevention focus was negatively related to productivity and positively related to safety performance. These findings are compatible with Klugar et al's (2004) results showing that regulatory focus changes the weighting given to events with low and high probabilities. Since accidents tend to have a low probability, individuals in a prevention focus might overweight the likelihood of accidents and decrease their risk-taking, perhaps in part explaining Wallace and Chen's (2006) findings. Wallace (in press) also looked at the effect of regulatory focus on performance on a laboratory task and found that regulatory focus was related to the emphasis placed on safety and production in the same pattern as that observed n Wallace and Chen's (2006) field study. In summary, there appear to be differences between those in a promotion focus and those in a prevention focus relevant to behavior intended toward safety and production goals, suggesting that promotion focus is negatively related to safety and positively related to production, while prevention focus is positively related to safety and negatively related to production.

This valuable program of research, however, has focused primarily on the performance of present- and self-focused safety behaviors, particularly behaviors where individuals manage their risk with their immediate environment. Regulatory focus has not been applied to behaviors where individuals attempt to change the safety context of the work environment for others and in the future. Present-focused behaviors are often primarily concerned with the avoidance of immediate negative outcomes. In contrast, future-focused and other-focused safety behaviors, while concerned with the avoidance of accidents, are also focused on improving future working conditions and procedures. In other words, future- and other-focused safety behaviors are concerned with gains in the quality of the work environment as well as losses in the form of accident or injury, while present-focused safety behaviors are primarily concerned with avoiding accidents and injuries. Future- and other-focused safety behaviors are also less likely to be specified as part of one's task requirements. For example, it has been shown that there is considerable variability in the role definition of safety citizenship behaviors, many of which have delayed and other-focused outcomes such as safety-related environmental change or changes in the behavior of others (Hofmann, Morgeson, & Gerras, 2003).

Given that psychologically distant safety behaviors are not be as likely to be a part of one's formal role obligations and are motivated by improvement toward more ideal conditions, these behaviors may be driven by ideals, such as a hazard-free workplace, to a greater degree than by obligations, such as rule-following behavior. According to regulatory focus theory (Higgins, 1997) promotion focus is associated with approach as a strategic means and the achievement of desired states. Psychologically distant safety performance may be the result of a strategic orientation towards improving oneself and the workplace and, in a broader sense, achieving a better state. In contrast, psychologically close safety performance may be more likely to arise out of a strategic orientation towards avoiding unwanted outcomes and maintaining stability.

While the case can be made that future- and other-focused safety is increased with a promotion regulatory focus, it is also motivated to a certain extent by accident

93

avoidance, which reflects an avoidant orientation and a prevention focus, as noted above. Hence, it may be that future- and other-focused safety performance are positively related to both promotion *and* prevention regulatory foci, whereas present- and self-focused safety performance are positively related to prevention focus and negatively related to promotion focus. Such a pattern of findings is plausible given that prevention and promotion foci, as measured with Wallace et al.'s (2005) regulatory focus at work scale, have been found to be relatively independent. In fact, in Wallace and Chen's (2006) study, the correlation between promotion and prevention focus was .01, suggesting they are nearly orthogonal. Higgins (1997) also proposed that prevention and promotion foci are distinct dimensions. This leads to the following hypotheses with respect to regulatory focus:

> H7: Prevention focus is positively related to the performance of all four types of safety behaviors.
> H8: Promotion focus is negatively related to the performance of present/self-focused behaviors and positively related to other/future-focused behaviors.

The expected relationship between promotion focus and present/other and future/self behaviors is less clear. Each of these types of behaviors has either temporal or social distance associated with their outcomes, but not both. It is unclear whether temporal or social distance would have a stronger impact on the effect of promotion regulatory focus. Hence, the relationship between promotion focus and these behaviors will be examined in an exploratory manner.

The final psychological state that I propose plays a stronger positive role in psychologically distant safety behaviors is organizational identification. Specifically, organizational identification may have implications for other-focused behaviors. There are two related arguments for this link. First, identification reduces the social distance of the expected outcomes of other-focused safety behaviors and in turn increases their intrinsic value, making those behaviors more preferred. Ashforth and Mael (1989) stated that "identification is the perception of oneness with or belongingness to a group, involving direct or vicarious experiences of its successes and failures (p. 34)." This social identification occurs when individuals see themselves as representative of their group and perceive group characteristics as self descriptive (Ellemers et al., 2004). Individuals who identify with their work organization will likely place a greater value on organizational outcomes (e.g., safety of the work environment) than those low in organizational identification and therefore be more likely to perform behaviors that increase those organizational outcomes.

A second, broader argument for the importance of organizational identification in the motivation of other-focused safety behaviors is that individuals largely share with others the responsibility for keeping coworkers safe. Hence, the responsibility for performing behaviors with outcomes that influence others, particularly with respect to maintaining and enhancing a safe work environment, is often shared. The safety of the work environment is typically achieved through the joint contributions of several employees rather than behavior of a single individual. This has been noted in industry, such as in a guest editorial in the *Journal of Advanced Nursing*, where the executive director of the Canadian Nurses Association, Lucille Auffrey (2005, p. 563), stated,

"Patient safety is a shared responsibility. System accountability requires that all members of the health care team work collaboratively to identify and manage problems in the system."

One of the primary ways in which shared responsibilities differ from individual responsibilities is in the extent to which individuals are motivated to fulfill responsibilities when others can also fulfill them. The decrease in effort when individuals are working as part of a group relative to when working alone is labeled *social loafing* (Latane, Williams, & Harkins, 1979). Social loafing has been the subject of a considerable body of research, some of which is summarized in Karau and Williams' (1993) meta-analysis. There have been several reasons proposed for the motivation loss that individuals experience in groups. First, social impact has been described as inversely proportional to the number of its recipients (Latane, 1981), resulting in lower arousal for each individual (Jackson & Williams, 1985). In this sense, the more people that are exposed to a stimulus as a group, the lower the influence is on any individual. Second, the inability to identify individual input in group settings can result in less effort (e.g., Williams, Harkins, & Latane, 1981). Third, individuals in groups may feel their effort is dispensable, particularly when in a situation where if any one of the group members reaches a performance criterion the group succeeds (i.e., a disjunctive task) (Kerr, 1983).

An approach based on expectancy theory that has been used to explain group motivation loss is Karau and Williams' (1993) Collective Effort Model (CEM), which applies Vroom's (1964) expectancy theory to motivation in group and shared effort situations. Similar to expectancy theory, CEM proposes that individuals exert effort on a collective task to the extent that they believe their effort is instrumental in obtaining valued outcomes. In order to individuals to be motivated to perform when these outcomes are at the group level, they must view their behavior as instrumental in the group's performance, which then must result in valued individual outcomes. Behaviors that contribute to the safety of the overall work environment such as initiating safety-related change, participating in health and safety committees, and helping coworkers perform task procedures more safely can usually be performed by several different people on a worksite, making one's individual input appear less instrumental and identifiable than it would be if one was the only employee that could improve the work safety environment. Hence, the perceived association between individual behavior and group outcomes is reduced for other-focused safety behaviors, since if one does not perform a necessary other-focused behavior, a coworker might pick up the slack and the group might be just as well off. In addition, according to CEM, group outcomes must result in important individual outcomes for motivation to be high. In some cases the relationship between group and individually-important outcomes may not be strong, particularly if group identity is weak such that group outcomes are not individually valued.

Applications of theories of group motivation loss to workplace safety have been rare. Benevento (1998) discussed the relevance of these approaches, including social loafing, but very little empirical research has been done to determine the impact of the aforementioned factors on individual motivation to perform tasks safely. Henriksen and Dayton (2006) noted, under conditions of social loafing where responsibility for patient care is spread out among group members, that health care providers frequently miss

95

components of care, particularly when roles are not clearly defined. Gopher and colleagues (2000) showed that in signal detection tasks where responsibility is shared, it is actually rational for individuals to make riskier decisions and maintain a higher signal threshold when there is a risky payoff. This has implications for accident prevention since many accidents reflect signal detection problems; Gopher et al.'s study suggests that free-riding or social loafing occurs at the perceptual level, meaning that individuals relax their vigilance when they share the responsibility for detecting hazardous signals with others. Outside of these studies, social loafing factors have not been researched in the psychological literature with respect to safety performance, despite their relevance.

Given the proposed role of group motivation loss in contextual safety performance, it is expected that the factors that mitigate the effects of social loafing in general would also mitigate their impact on other-focused behaviors, most of which involve shared responsibilities. One moderator of social loafing effects is the extent to which individuals identify with other group members. In Karau and Williams' (1993) meta-analysis, they found that when individuals were working with friends as teammates, or were put in a situation to foster cohesiveness, social loafing effects were eliminated. This suggests that when individuals identify with other work organizational members or the organization as a whole they are less likely to exhibit social loafing. Cohesion in general also has been shown to attenuate social loafing (Karau & Hart, 1998). Similarly, others have proposed that social identification and collective identity plays an important role in motivation in work groups (Ellemers, Gilder, & Haslam, 2004). Individuals with a strong interpersonal and collective identity have common bonds with other group members share a symbolic group membership. When these identities are activated, individuals are more likely to act in the benefit of others and for the collective welfare of the group (Brewer & Gardner, 1996). Hogg and Terry (2000) proposed that such motives are particularly applicable to organizations where individuals act on a group's behalf. These perspectives all suggest that group and collective identification increases motivation towards group goals and results.

In the context of safety, it would be expected that behaviors that are other-focused, which can usually be fulfilled by one of several employees and have safety benefits at the organizational level, are more likely to occur when individuals identify themselves with their organization. Those with a high level of organizational identification may place a greater value on organizational outcomes, diminishing the impact of group motivation loss on other-focused safety behaviors and reducing or minimizing the impact of social distance on the intrinsic value of outcomes that impact others and the organization as a whole.

H9a: Organizational identification is positively related to the performance of other-focused behaviors (present and future-focused).

The factors identified in theories of group motivation loss would not be expected to play a significant role in most, if not all, self-focused behaviors; for example one's self-protective behavior usually cannot be performed by coworkers and the effects of self-protective behavior are primarily individual and do not depend on team outcomes. Furthermore, the intrinsic value of one's own safety outcomes is not dependent on a reduced social distance with others through a shared organizational identity. Hence,

organizational identification would not be expected to be as strong of a predictor of the performance of self-focused safety behaviors as of the performance of other-focused safety behaviors.

H9b: Organizational identification is more strongly positively related to the performance of other-focused safety behaviors (present and future-focused) than self-focused safety behaviors (present and future-focused).

Organizational identification may partially explain the link between community and affiliation goals and other-focused behaviors. Community and affiliation goals reflect guiding principles that would likely draw one to identify with and act for the benefit of others and society as a whole, as well as the desire to maintain meaningful relationships with others (Grouzet, 2005; Kasser & Ryan, 1993). Given that individuals with community and affiliation goals are likely to identify with and empathize with the outcomes of others, including coworkers, it is expected that they are more likely to identify with their organization. Hence, organizational identification is hypothesized to partially mediate the relationship between community and affiliation goals and the performance of other-focused safety behaviors.

H10: Organizational identification partially mediates the relationship between community and affiliation goals and the performance of other-focused safety behaviors (present and future-focused).

Research on safety motivation to this point has primarily focused on behaviors with psychologically close outcomes. In this research, I have proposed that some of the motivational bases for safety behaviors with psychologically distant outcomes differ from those for psychologically near outcome because they are 1) construed differently, 2) have different levels of intrinsic value, and 3) are driven by different psychological states. With these differences in mind, I have hypothesized several specific variables to predict psychologically distant-focused behaviors more effectively than psychologically close-focused behaviors. These hypotheses are summarized in Figure 2.

Appendix B: Pilot Study

Method

Participants

Leading experts in the field of occupational safety research were identified and recruited for participation. Participants were authors of workplace safety articles in the following journals: *Journal of Applied Psychology*, *Personnel Psychology*, *Journal of Occupational Health Psychology*, *Journal of Safety Research*, and *Safety Science*. Sixty-eight participants were identified, their email addresses were recorded, and they were sent a link to a survey to complete over the internet. Twenty one of these emails were returned as undeliverable. Thirteen out of the remaining 47 individuals participated, a response rate of 28 percent.

Measure and Procedure

Participants were asked to rate the extent to which each of 45 safety behaviors are present- or future-focused and self- or other-focused on a five-point scale. The present-future focused scale had responses ranging from *completely focused on present or immediate outcomes* to *completely focused on future or delayed outcomes* with the midpoint having an anchor of *focused equally on present and future outcomes*. The self-other focused scale had responses ranging from *completely focused on safety for oneself* to *completely focused on safety of others* with the midpoint having an anchor of *focused equally on safety for oneself and others*. These behaviors were drawn from two measures: Burke et al.'s (2002) four-dimensional measure of safety performance and Hofmann et al.'s (2003) measure of safety citizenship behaviors. I included generic behaviors from Burke et al.'s measure that they described as "applicable to almost all types of safety-related work" (Burke et al., 2002, p. 27). There were 17 such behaviors. These included wearing personal protective equipment, performing work tasks safely, and communicating safety-related information. One of the behaviors, referring to the wearing of personal protective equipment, was split into two behaviors to reference acute and cumulative injuries separately, resulting in 18 behaviors from Burke et al.'s measure. Twenty-seven of the behaviors came from Hofmann and colleagues' measure. These behaviors referred to helping, voice, stewardship, whistle blowing, civic virtue, and initiating safety-related change.

Results

ICC values, which measure the proportion of variance attributable to the objects of measurement (Shrout & Fleiss, 1979), were computed for two sets of ratings: 1) those for the safety behaviors on the present-future dimension and 2) those for the safety behaviors on the self-other dimension. Because the mean ratings, not individual ratings, were to be used to classify the behaviors, the ICC values for the mean scores, the ICC (C, k) and ICC (A, k) (McGraw & Wong, 1996) were the most appropriate to determine the reliability of the mean ratings. The ICC (C, k) and ICC (A, k) values were .80 and .78, respectively, for the present-future ratings and .91 and .89 for the self-other ratings. All values were significantly greater than .50, a large effect size, suggesting that there was sufficient reliability for using the mean ratings as a basis for classifying the behaviors.

Once the reliability of the mean ratings for the 45 safety behaviors was established, individual behaviors were divided into four categories as specified in Table 2: self-present focused, self-future focused, other-present focused, and other-future focused. Behaviors were categorized based on their standing relative to the scale midpoint (3) on the temporal and social distance dimensions. See Table 4 for the ratings for each of the behaviors and their classification and Figure 3 for a scatterplot of the behaviors on the temporal and social distance dimensions.

Table 1 also includes the Average Deviation Index (ADI) (Burke, Finkelstein, & Dusig, 1999) for each behavior. Burke and Dunlap (2002) proposed a maximum cutoff value for the ADI equal to the number of response options in the scale divided by six, which would be .83 in this case. There were several behaviors with an ADI of .83 or below in all categories except for the self-future category. However, the self-future category had one behavior below .83 and two behaviors within .03 of the .83 cutoff at .84 and .86.

Results from the ICCs and the ADIs suggest that at least three behaviors could be reliably categorized into the 4 proposed dimensions. These behaviors are shaded in Table 4 and are suitable for use as criteria studying safety performance along temporal and social focus dimensions.

Table 1.

Safety Behavior Ratings

Behavior	Present-Focused (1) vs. Future-Focused (5) Rating (SD in parentheses)	Self-Focused (1) Vs. Other-Focused (5) Rating (SD in parentheses)	Average Deviation Index
Self-Present Focused Behaviors			
Appropriately communicate with other workers while wearing personal protective equipment.	2.23 (0.73)	3.00 (0.00)	0.59, 0.00
Remove all personal protective equipment correctly.	1.92 (0.90)	2.17 (0.72)	0.61, 0.56
Use the appropriate personal protective equipment as indicated by the site health and safety plan.	1.62 (0.77)	1.62 (0.87)	0.66, 0.76
Correctly inspect and test all personal protective equipment.	1.77 (0.83)	2.23 (0.73)	0.71, 0.59
Properly perform work while wearing personal protective equipment.	2.00 (1.00)	2.54 (0.78)	0.77, 0.64
Wear all personal protective equipment correctly to prevent acute (severe) injuries.	1.69 (1.03)	1.77 (1.01)	0.85, 0.83
Apply the appropriate work practices to reduce exposures to hazards.	2.46 (1.13)	2.62 (0.65)	0.88, 0.53
Make appropriate decisions about use of monitoring equipment and interpretation of instrument readings.	2.54 (1.05)	2.85 (0.38)	0.89, 0.26
Correctly use applicable hazard controls and equipment (e.g., ventilation, physical barriers, remotely operated equipment).	2.15 (1.07)	2.69 (0.63)	0.93, 0.59
Wear all personal protective equipment correctly to prevent cumulative injuries.	2.23 (1.36)	1.77 (1.01)	1.21, 0.83
Self-Future Focused Behaviors			
Keep informed of changes in safety policies and procedures.	3.38 (0.77)	2.92 (0.49)	0.63, 0.28
Appropriately uses reference materials that may provide additional health and safety information (e.g., the National Institute for Occupational Safety and Health Pocket Guide)	3.31 (1.11)	2.85 (0.38)	0.84, 0.26

Behavior	Present-Focused (1) vs. Future-Focused (5) Rating (SD in parentheses)	Self-Focused (1) Vs. Other-Focused (5) Rating (SD in parentheses)	Average Deviation Index
Correctly store all personal protective equipment.	3.08 (1.12)	2.46 (0.88)	0.86, 0.59
Attending safety meetings.	3.31 (1.18)	2.85 (0.90)	0.90, 0.65
Takes the appropriate steps if prevented from or punished for exercising one's rights under OSHA policies and procedures.	3.69 (1.18)	2.62 (0.87)	0.95, 0.51
Try to change policies and procedures to make them safer.	4.08 (1.44)	3.00 (0.41)	0.99, 0.64
Take appropriate action to prevent recurrence of injuries, illnesses, accidents, and/or near misses.	3.46 (1.27)	2.77 (0.73)	1.04, 0.51
Attend non-mandatory safety-oriented meetings.	3.38 (1.39)	2.92 (0.86)	1.12, 0.57

Other-Present Focused Behaviors

Behavior			
Take action to stop safety violations in order to protect the well-being of other crew members.	2.77 (1.01)	3.92 (0.86)	0.66, 0.64
Assist others to make sure they perform their work safely.	2.69 (0.86)	4.00 (1.00)	0.69, 0.77
Properly dispose of materials and/or equipment that pose a health risk.	2.77 (1.01)	3.15 (0.38)	0.75, 0.26
Help others with safety related responsibilities.	3.00 (1.00)	3.92 (1.04)	0.77, 0.69
Tell other crew members to follow safe working procedures.	2.62 (0.96)	3.38 (1.12)	0.78, 0.88
Protect fellow crew members from safety hazards.	2.46 (0.97)	4.23 (0.83)	0.80, 0.59
Go out of the way to look out for the safety of other crew members.	2.54 (0.97)	4.23 (1.09)	0.80, 0.71
Take action to protect other crew members from risky situations.	2.54 (0.97)	4.31 (0.86)	0.80, 0.64
Report crew members who violate safety procedures.	2.85 (1.07)	3.23 (1.09)	0.83, 0.78
Try to prevent other crew members from being injured on the job.	2.69 (1.11)	4.31 (0.86)	0.84, 0.64
Monitor new crew members to ensure they are performing safely.	2.62 (1.04)	3.54 (1.05)	0.84, 0.88
Engage in appropriate methods to notify workers, supervisors, and/or emergency coordinators of emergency conditions.	2.54 (1.27)	3.62 (0.65)	1.11, 0.57

Other-Future Focused Behaviors

Behavior	Present-Focused (1) vs. Future-Focused (5) Rating (SD in parentheses)	Self-Focused (1) Vs. Other-Focused (5) Rating (SD in parentheses)	Average Deviation Index
Help other work crew members learn about safe work practices.	3.54 (0.66)	3.69 (0.86)	0.58, 0.69
Get involved in safety activities to help the work crew work more safely.	3.31 (0.86)	3.69 (0.95)	0.63, 0.79
Express opinions on safety matters even if others disagree	3.77 (1.01)	3.31 (0.75)	0.66, 0.58
Raise safety concerns during planning sessions.	3.85 (1.07)	3.31 (0.63)	0.70, 0.47
Speak up and encourage others to get involved in safety issues.	3.92 (1.12)	3.62 (0.77)	0.73, 0.66
When necessary, communicates potential exposures to key personnel responsible for site health and safety.	3.54 (1.05)	3.31 (0.48)	0.80, 0.43
Volunteering for safety committees.	3.69 (1.11)	3.54 (0.78)	0.84, 0.66
Make safety-related recommendations about work activities.	3.62 (1.12)	3.23 (0.60)	0.84, 0.47
Explaining to other crew members that you will report safety violations.	3.08 (1.19)	3.31 (1.11)	0.86, 0.84
Try to improve safety procedures.	4.00 (1.41)	3.23 (0.60)	0.92, 0.47
Helping teach safety procedures to new crew members.	3.31 (1.18)	4.15 (0.90)	0.95, 0.78
Appropriately report incidents, accidents, and/or illnesses.	3.69 (1.25)	3.08 (0.49)	0.99, 0.78
Tell new crew members that safety violations will not be tolerated.	3.08 (1.32)	3.38 (0.96)	1.02, 0.72
Try to change the way the job is done to make it safer.	3.77 (1.54)	3.15 (0.38)	1.24, 0.26
Make suggestions to improve the safety of a mission.	3.54 (1.61)	3.15 (0.56)	1.34, 0.39

Appendix C: Survey Items

Psychological Empowerment Scale

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	The work I do is very important to me.	1	2	3	4	5
2.	My job activities are personally meaningful to me.	1	2	3	4	5
3.	The work I do is meaningful to me.	1	2	3	4	5
4.	I am confident about my ability to do my job.	1	2	3	4	5
5.	I am confident about my ability to perform my work activities.	1	2	3	4	5
6.	I have the skills necessary for my job.	1	2	3	4	5
7.	I have a lot of control in determining how I do my job.	1	2	3	4	5
8.	I can decide how to do my work.	1	2	3	4	5
9.	I have a lot of opportunity for independence and freedom in how I do my job.	1	2	3	4	5
10.	I have a large impact on what happens in my department.	1	2	3	4	5
11.	I have a lot of control over what happens in my department.	1	2	3	4	5
12.	I have significant voice over what happens in my department.	1	2	3	4	5

Perceptions of Management Commitment to Safety Scale

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	My boss says a good word whenever he/she sees a job done according to the safety rules.	1	2	3	4	5
2.	My boss seriously considers any worker's suggestions for improving safety.	1	2	3	4	5
3.	My boss approaches workers during work to discuss safety issues.	1	2	3	4	5
4.	As long as there is no accident, my boss doesn't care how the work is done.	1	2	3	4	5
5.	Whenever pressure builds up, my boss wants us to work faster, rather than by the rules.	1	2	3	4	5
6.	My boss only keeps track of major safety problems and overlooks routine problems.	1	2	3	4	5

Organizational Identification Scale

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	When someone criticizes my organization, it feels like a personal insult.	1	2	3	4	5
2.	I am very interested in what others think about my organization.	1	2	3	4	5
3.	When I talk about my organization, I usually say "we" rather than "they".	1	2	3	4	5
4.	My organization's successes are my successes.	1	2	3	4	5
5.	When someone praises my organization, it feels like a personal compliment.	1	2	3	4	5

Regulatory Focus Scale

		Not at all true of me								Very True of me
1.	At work, I am focused on preventing negative events.	1	2	3	4	5	6	7	8	9
2.	I am anxious that I will fall short of my responsibilities at work.	1	2	3	4	5	6	7	8	9
3.	I frequently imagine how I will achieve my hopes and aspirations at work.	1	2	3	4	5	6	7	8	9
4.	I often think about the employee I am afraid I might become in the future.	1	2	3	4	5	6	7	8	9
5.	I often think about the employee I would ideally like to be in the future.	1	2	3	4	5	6	7	8	9
6.	I typically focus on the success I hope to achieve in the future at work.	1	2	3	4	5	6	7	8	9
7.	I often worry that I will fail to accomplish my work goals.	1	2	3	4	5	6	7	8	9
8.	I often think about how I will achieve success at work.	1	2	3	4	5	6	7	8	9
9.	I frequently think about how I can prevent failures in my workplace.	1	2	3	4	5	6	7	8	9
10.	At work, I am more oriented toward preventing losses than I am toward achieving gains.	1	2	3	4	5	6	7	8	9
11.	My major goal at work right now is to achieve my work ambitions.	1	2	3	4	5	6	7	8	9
12.	My major goal at work right now is to avoid becoming a failure as an employee.	1	2	3	4	5	6	7	8	9
13.	I see myself as someone who is primarily striving to become the employee I "ought" to be – to full my duties.	1	2	3	4	5	6	7	8	9
14.	At work, I am focused on achieving positive outcomes in my workplace.	1	2	3	4	5	6	7	8	9
15.	I often imagine myself experiencing good things that I hope will happen to me at work.	1	2	3	4	5	6	7	8	9
16.	Overall at work, I am more oriented toward achieving success than preventing failure.	1	2	3	4	5	6	7	8	9

Safety Behavior Scale

Below is a list of behaviors one can perform at work. For each behavior, indicate how often you perform the behavior. Your individual responses to these (and all other) items are anonymous will NOT be shared with your employer or coworkers, so please be as honest as possible.

	Much less than the average employee	Less than the average employee	About the same as the average employee	More than the average employee	Much more than the average employee
1. Use the appropriate personal protective equipment.	1	2	3	4	5
2. Remove all personal protective equipment correctly.	1	2	3	4	5
3. Appropriately communicate with other workers while wearing personal protective equipment.	1	2	3	4	5
4. Correctly store all personal protective equipment.	1	2	3	4	5
5. Appropriately use reference materials that may provide additional health and safety information (e.g., MSDS).	1	2	3	4	5
6. Keep informed of changes in safety policies and procedures.	1	2	3	4	5
7. Assist others to make sure they perform their work safely.	1	2	3	4	5
8. Take action to stop safety violations in order to protect the well-being of other staff members.	1	2	3	4	5
9. Tell other staff members to follow safe working procedures.	1	2	3	4	5
10. Help other staff members learn about safe work practices.	1	2	3	4	5
11. Get involved in safety activities to help other staff members work more safely.	1	2	3	4	5
12. Express opinions on safety matters even if others disagree.	1	2	3	4	5

Goals Scales

This set of questions asks you about **goals** you may have for the future. Rate each item by **circling how important each goal is to you**. Try to use the entire scale when rating the items. Some of your answers will likely be at the lower end of the scale, some will be in the middle, and others will be at the higher end of the scale.   Rate the importance of each of the following goals to you**.**

		Not at all important	A little important	Moderately important	Very important	Extremely important
1.	I will assist people who need it and ask nothing in return.	1	2	3	4	5
2.	I will have few threats to my personal safety.	1	2	3	4	5
3.	My basic needs for food, shelter, and clothing will be met.	1	2	3	4	5
4.	The things I do will make other people's lives better.	1	2	3	4	5
5.	I will be in good physical shape.	1	2	3	4	5
6.	I will feel safe and secure.	1	2	3	4	5
7.	I will feel good about my level of physical fitness.	1	2	3	4	5
8.	I will not have to worry about bad things happening to me.	1	2	3	4	5
9.	I will be relatively free from sickness.	1	2	3	4	5
10.	I will help the world become a better place.	1	2	3	4	5
11.	I will be physically healthy.	1	2	3	4	5

Demographics

To help interpret the responses, please answer the following demographic questions.

1. Are you a manager or supervisor?

    a. Yes
    b. No

2. How long have you been at your organization?

    a. Less than 1 year
    b. 1 year to less than 3 years
    c. 3 years to less than 5 years
    d. 5 years to less than 10 years
    e. 10 years to less than 20 years
    f. 20 years or more

3. Your gender
    a. Man
    b. Woman

4. What department do you currently work in?

    _____

5. What is your current job title?

    _____

6. How old are you?

    a. Less than 20 years old
    b. 20 to less than 30 years old
    c. 30 to less than 40 years old
    d. 40 to less than 50 years old
    e. 50 years or older

7. What is your race (if more than one, circle all that apply)?

    a. White
    b. Black or African American
    c. American Indian or Alaska Native
    d. Asian
    e. Native Hawaiian or Other Pacific Islander

Table 1.

Factor Loadings for Predictor Scales

Item	Loading	Item	Loading
Meaningfulness 1	.76	Promotion focus 1	.75
Meaningfulness 2	.87	Promotion focus 2	.69
Meaningfulness 3	.86	Promotion focus 3	.86
Confidence 1	.89	Promotion focus 4	.84
Confidence 2	.87	Promotion focus 5	.43
Confidence 3	.66	Promotion focus 6	.21
Self-determination 1	.77	Promotion focus 7	.49
Self-determination 2	.85	Promotion focus 8	.25
Self-determination 3	.86	Prevention focus 1	.10
Impact 1	.86	Prevention focus 2	.66
Impact 2	.95	Prevention focus 3	.64
Impact 3	.91	Prevention focus 4	.72
Supervisor behavior 1	.85	Prevention focus 5	.42
Supervisor behavior 2	.88	Prevention focus 6	.49
Supervisor behavior 3	.74	Prevention focus 7	.49
Supervisor expectations 1	.63	Prevention focus 8	.33
Supervisor expectations 2	.90	Community goal 1	.42
Supervisor expectations 3	.75	Community goal 2	.90
Organizational ID 1	.67	Community goal 3	.59
Organizational ID 2	.77	Health goal 1	.91
Organizational ID 3	.77	Health goal 2	.91
Organizational ID 4	.83	Health goal 3	.54
Organizational ID 5	.81	Health goal 4	.83
		Security goal 1	.68
		Security goal 2	.64
		Security goal 3	.60
		Security goal 4	.67

Table 2.

Factor Loadings for Safety Behavior Scales

Item	Factor Loading
Self-Present	
Use the appropriate personal protective equipment	.89
Remove all personal protective correctly	.91
Appropriately community with other workers while wearing personal protective equipment	.94
Self-Future	
Correctly store all personal protective equipment	.93
Appropriately use reference materials that may provide additional health and safety information (e.g., MSDS)	.81
Keep informed of changes in safety policies and procedures	.80
Other-Present	
Assist others to make sure they perform their work safely	.90
Take action to stop safety violations in order to protect the well-being of other staff members	.94
Tell other staff members to follow safe working procedures	.95
Other-Future	
Help other staff members learn about safe work practices	.96
Get involved in safety activities to help other staff members work more safely	.88
Express opinions on safety matters even if others disagree	.88

Table 3.

Unstandardized Gamma Weights and Tests for Slope Differences Across Units

Predictor	Self-Present Safety	Self-Future Safety	Other-Present Safety	Other-Future Safety
Meaningfulness	.21 (.55)	.24 (2.18)	**.30** (4.55)	**.36** (3.27)
Competence	**.46** (1.98)	**.48** (1.30)	**.49** (.42)	**.46** (1.05)
Self-determination	.08 (.39)	.13 (1.85)	**.21** (4.65)	**.21** (2.90)
Impact	.01 (.45)	.08 (2.34)	**.17** (5.77)	**.21** (6.19*)
Supervisor safety behavior	-.11 (4.18)	-.03 (5.24)	.05 (3.43)	.04 (1.00)
Supervisor safety expectations (n)	-.03 (2.44)	-.05 (.56)	**-.14** (.01)	-.06 (.01)
Organizational identification	.05 (.49)	.11 (1.46)	**.17** (.58)	**.20** (.18)
Promotion focus	**.11** (1.57)	**.11** (3.42)	**.11** (.87)	**.11** (1.23)
Prevention focus	**.09** (.66)	**.08** (1.88)	**.09** (1.57)	**.07** (6.41*)
Affiliation goals	**.43** (.09)	**.47** (.88)	**.51** (1.24)	**.39** (1.53)
Health goals	.18 (.00)	.13 (.79)	.11 (1.09)	.08 (1.04)
Security goals	.12 (2.51)	-.03 (4.09)	-.02 (6.85*)	-.05 (4.60)

Note: Weights in **Bold** are significant at the .05 alpha level. Chi-Square values for slope differences are in parentheses. An asterisk indicates the slope differences are significant at the .05 alpha level (df = 2 for all tests).

REFERENCES

REFERENCES

Alge, B. J., Ballinger, G. A., Tangirala, S. & Oakley, J. L. (2006). Information privacy in organizations: Empowering creative and extrarole performance. *Journal of Applied Psychology, 91,* 221-232.

Andriessen, J. H. T. H. (1978). Safe behavior and safety motivation. *Journal of Occupational Accidents, 1,* 363-376.

Ashforth, B. E. (1989). The experience of powerlessness in organizations. *Organizational Behavior and Human Decision Processes, 43,* 207-242.

Ashforth, B. E., & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review, 14,* 20-39.

Aspinwall, L. G., & Taylor, S. E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin, 121,* 417-436.

Auffrey, L. (2005). Nurses leading on patient safety. *Journal of Advanced Nursing, 49,* 563.

Avolio, B. J., Zhu, W., & Koh, W. (2004). Transformational leadership and organizational commitment: Mediating role of psychological empowerment and moderating role of structural distance. *Journal of Organizational Behavior, 25,* 951-968.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37,* 122-147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Upper Saddle River, NJ: Prentice-Hall.

Bar-Anan, Y., Liberman, N., & Trope, Y. (2006). The association between psychological distance and construal level: Evidence from an implication association test. *Journal of Experimental Psychology: General, 135,* 609-622.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein, & S. W. J. Kozlowski

(Eds.), *Multilevel theory, research, and methods in organizations* (pp. 349-381). San Francisco: Jossey-Bass.

Borman, W. C., & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt, & W. C. Borman, (Eds.), *Personnel selection in organizations* (pp. 71-98). San Francisco: Jossey-Bass.

Brazy, P. C., & Shah, J. Y. (2006). Strength and safety in numbers: Considering the social implications of regulatory focus. *Journal of Personality, 74,* 1647-1672.

Brewer, M. B., & Gardner, W. (1996). Who is this "we"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology, 71,* 83-93.

Brief, A. P., & Nord, W. R. (1990). *Meanings of Occupational Work*. Lexington, MA: Lexington Books.

Bureau of Labor Statistics. (2007). Retrieved from http://www.bls.gov/iif/home.htm on May 16, 2007.

Burke, M. J., & Dunlap, W. P. (2002). Estimating interrater agreement with the Average Deviation Index: A user's guide. *Organizational Research Methods, 5,* 159-172.

Burke, M. J., Finkelstein, L. M., & Dusig, M. S. (1999). On average deviation indices for estimating interrater agreement. *Organizational Research Methods, 2,* 49-68.

Burke, M. J., Sarpy, S. A., Tesluk, P. E., & Smith-Crowe, K. (2002). General safety performance: A test of a grounded theoretical model. *Personnel Psychology, 55,* 429-457.

Carver, C. S., & Scheier, M. F. (1982). Control theory: a useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin, 92,* 111-135.

Coffey, S. F., Gudleski, G. D., Saladin, M. E., & Brady, K. T. (2003). Impulsivity and rapid discounting of delayed hypothetical rewards in cocaine-dependent individuals. *Experimental and Clinical Psychopharmacology, 11,* 18-25.

Crowe, E., & Higgins, E. T. (1997). Regulatory focus and strategic inclinations: Promotion and prevention in decision-making. *Organizational Behavior and Human Decision Processes, 69,* 117-132.

Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology, 74,* 580-590.

DeShon, R. P., & Gillespie, J. Z. (2005). A motivated action theory account of goal orientation. *Journal of Applied Psychology, 90,* 1096-1127.

DeShon, R. P., Kozlowski, S. W. J., Schmidt, A. M., Milner, K. R., & Wiechmann, D. (2004). A multiple-goal, multilevel model of feedback effects on the regulation of individual and team performance. *Journal of Applied Psychology, 89,* 1035-1056.

Ellemers, N., de Gilder, D., & Haslam, S. A. (2004). Motivating individuals and groups at work: A social identity perspective on leadership and group performance. *Academy of Management Review, 29,* 459-478.

Forster, J., Higgins, E. T., & Bianco, A. T. (2003). Speed/accuracy decision in task performance: Built in trade-off or separate strategic concerns. *Organizational Behavior and Human Decision Processes, 90,* 148-164.

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, N. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology, 90,* 351-367.

Geller, E. S., Roberts, D. S., & Gilmore, M. R. (1996). Predicting propensity to actively care for occupational safety. *Journal of Safety Research, 27,* 1-8.

Gopher, D., Itkin-Webman, T., Erev, I., Meyer, J., & Armony, L. (2000). The effect of shared responsibility and competition in perceptual games: A test of a cognitive game-theoretic extension of signal detection theory. *Journal of Experimental Psychology: Human Perception and Performance, 26,* 325-341.

Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health Psychology, 5,* 347-358.

Grouzet, F. M. E., Kasser, T., Ahuvia, A., Dols, J. M. F., Kim, Y., Lau, S., Ryan, R. M.,, Saunders, S., Schmuck, P., & Sheldon, K. M. (2005). The structure of goal contents across 15 cultures. *Journal of Personality and Social Psychology, 89,* 800-816.

Hall, R. J., Snell, A. F., & Foust, M. S. (1999). Item parceling strategies in SEM: Investigating the subtle effects of unmodeled secondary constructs. *Organizational Research Methods, 2,* 233-256.

Heider, F., (1944). Social perceptions and phenomenal causality. *Psychological Review, 51,* 358-374.

Henriksen, K., & Dayton, E. (2006). Organizational silence and hidden threats to patient safety. *Health Services Research, 41,* 1539-1554.

116

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist, 52,* 1280-1300.

Higgins, E. T., Roney, C., Crowe, E., & Hymes, C. (1994). Ideal versus ought predilections for approach and avoidance: Distinct self-regulatory systems. *Journal of Personality and Social Psychology, 66,* 276-286.

Higgins, E. T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology, 72,* 515-525.

Hoffman, B. J., Blair, C. A., Meriac, J. P., & Woehr, D. J. (2007). Expanding the criterion domain? A quantitative review of the OCB literature. *Journal of Applied Psychology, 92,* 555-566.

Hofmann, D. A., Morgeson, F. P., & Gerras, S. J. (2003). Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: Safety climate as an exemplar. *Journal of Applied Psychology, 88,* 170-178.

Hogg, M. A., & Terry, D. J. (2000). Social identity and self-categorization processes in organizational contexts. *Academy of Management Review, 25,* 121-140.

Jones, E. E. (1979). The rocky road from acts to dispositions. *American Psychologist, 34,* 107-117.

Joreskog, K., & Sorbom, D. (2003). *LISREL 8.72* [Computer software]. Lincolnwood, IL: Scientific Software International.

Karau, S. J., & Hart, J. W. (1998). Group cohesiveness and social loafing: Effects on social interaction manipulation on individual motivation within groups. *Group Dynamics, 2,* 185-191.

Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65,* 681-706.

Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology, 65,* 410-422.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin, 22,* 280-287.

Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology, 45,* 819-828.

Komaki, J., Heinzmann, A. T., & Lawson, L. (1980). Effect of training and feedback: Component analysis of a behavioral safety program. *Journal of Applied Psychology, 65,* 261-270.

Laschinger, H. K. S., Finegan, J. E., Shamian, J., & Wilk, P. (2004). Longitudinal analysis of the impact of workplace empowerment on work satisfaction. *Journal of Organizational Behavior, 25,* 527-545.

Latane, B. (1981). The psychology of social impact. *American Psychologist, 36,* 343-356.

Latane, B., Williams, K., & Harkins, S. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology, 37,* 822-832.

Leone, L., Perugini, M., & Bagozzi, R. P. (2005). Emotions and decision making: Regulatory focus moderates the influence of anticipated emotions on action evaluation. *Cognition and Emotion, 19,* 1175-1198.

LePine, J. A., & Van Dyne, L. (2001a). Voice and cooperative behavior as contrasting forms of contextual performance: Evidence of differential relationships with big five personality characteristics and cognitive ability. *Journal of Applied Psychology, 86,* 326-336.

LePine, J. A., & Van Dyne, L. (2001b). Peer responses to low performers: An attributional model of helping in the context of groups. *Academy of Management Review, 26,* 67-84.

Lewin, K. (1951). *Field theory in social science.* New York: Harper.

Lewin, K. (1952). Constructs in field theory [1944]. In D. Cartwright (Ed.), *Field theory in social science: Selected theoretical papers by Kurt Lewin* (pp. 30-42). London: Tavistock.

Lippin, T. M., Eckman, A., Calkin, K. R., & McQuiston, T. H. (2000). Empowerment-based health and safety training: Evidence of workplace change. *American Journal of Industrial Medicine, 38,* 697-706.

Lockwood, P., Jordan, C. H. & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology, 83,* 854-864.

Loewenstein, G. E., & Elster, J. (Eds.). (1992). *Choice over time.* New York: Russell Sage Foundation.

Lord, R. G., & Kernan, M. C. (1987). Scripts as determinants of purposeful behavior in organizations. *Academy of Management Review, 12,* 265-277.

Mael, F. A., & Ashforth, B. E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior, 13,* 103-123.

Melamed, S., Rabinowitz, S., Feiner, M., Weisberg, E., & Ribak, J. (1996). Usefulness of the protection motivation theory in explaining hearing protection device use among male industrial workers. *Health Psychology, 15,* 209-215.

Mellers, B. A. (2000). Choice and the relative pleasure of consequences. *Psychological Bulletin, 126,* 910-924.

Motowidlo, S. J., Borman, W. C., & Schmit, M. J. (1997). A theory of individual differences in task and contextual performance. *Human Performance, 10,* 71-83.

Motowidlo, S. J., & Van Scotter, J. R. (1994). Evidence that task performance should be distinguished from contextual performance. *Journal of Applied Psychology, 79,* 475-480.

Mullen, J. (2005). Testing a model of employee willingness to raise safety issues. *Canadian Journal of Behavioural Science, 37,* 273-282.

Murphy, K. R. (2008). Explaining the weak relationship between job performance and ratings of job performance. *Industrial and Organizational Psychology, 1,* 148-160.

Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology, 91,* 946-953.

Norris, F. H. (1997). Frequency and structure of precautionary behavior in the domains of hazard preparedness, crime prevention, vehicular safety, and health maintenance. *Health Psychology, 16,* 566-575.

O'Donoghue, T., & Rabin, M. (1999). Incentives for procrastinators. *Quarterly Journal of Economics, 114,* 769-816.

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome.* Lexington, MA; Lexington Books.

119

Park, B., Ryan, C. S., & Judd, C. M. (1992). Role of meaningful subgroups in explaining differences in perceived variability for in-groups and out-groups. *Journal of Personality and Social Psychology, 63,* 553-567.

Reason, J. (1990). *Human Error.* New York: Cambridge University Press.

Reynolds, B., Patak, M., Shroff, P., Penfold, R. B., Melanko, S., & Duhig, A. M. (2007). Laboratory and self-report assessments of impulsive behavior in adolescent daily smokers and nonsmokers. *Experimental and Clinical Psychopharmacology, 15,* 264-271.

Robins, R. W., Spranca, M. D., & Mendelsohn, G. A. (1996). The actor-observer effect revisited: Effects of individual differences and repeated social interactions on actor and observer attributions. *Journal of Personality and Social Psychology, 71,* 375-389.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55,* 68-78.

Sass, D. A., & Smith, P. L. (2006). The effects of parceling unidimensional scales on structural parameter estimates in structural equation modeling. *Structural Equation Modeling, 13,* 566-586.

Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology, 53,* 550-562.

Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology, 58,* 878-891.

Shah, J. Y., Brazy, P. C., & Higgins, E. T. (2004). Promoting us vs. preventing them: Regulatory focus and the manifestations of intergroup bias. *Personality and Social Psychology Bulletin, 30,* 433-446.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing reliability. *Psychological Bulletin, 86,* 420-428.

Smith, P. K., & Trope, Y. (2006). You focus on the forest when you're in charge of the trees: Power priming and abstract information processing. *Journal of Personality and Social Psychology, 90,* 578-596.

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal, 38,* 1442-1465.

Spreitzer, G. M. (1996). Social structural characteristics of psychological empowerment. *Academy of Management Journal, 39,* 483-504.

Spreitzer, G. M., de Janasz, S. C., & Quinn, R. E. (1999). Empowered to lead: The role of psychological empowerment in leadership. *Journal of Organizational Behavior, 20,* 511-526.

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin, 133,* 65-94.

Steel, P., & Konig, C. J. (2006). Integrating theories of motivation. *Academy of Management Review, 31,* 889-913.

Stetzer, A., & Hofmann, D. A. (1996). Risk compensation: Implications for safety interventions. *Organizational Behavior and Human Decision Processes, 66,* 73-88.

Thomas, K. W., & Velthouse, B. A. (1990). Cognitive elements of empowerment. *Academy of Management Review 15,* 666-681.

Trope, Y., & Liberman, N. (2000). Temporal construal and time-dependent changes in preference. *Journal of Personality and Social Psychology, 79,* 876-889.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110,* 403-421.

Van Dyne, L., Graham, J. W., & Dienesch, R. M. (1994). Organizational citizenship behavior: Construct redefinition, measurement, and validation. *Academy of Management Journal, 37,* 765-802.

Van Dyne, L., & LePine, J. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management Journal, 41,* 108-119.

Verplanken, B., & Holland, R. W. (2002). Motivated decision making: Effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology, 82,* 434-447.

Vroom, V. H. (1964). *Work and Motivation.* New York: Wiley.

Wallace, J. C. (in press). The moderating effects of task complexity on the relationship between regulatory foci and safety and production performance. *Journal of Occupational Health Psychology.*

Wallace, J. C., & Chen, G. (2006). A multilevel integration of personality, climate, self-regulation, and performance. *Personnel Psychology, 59,* 529-557.

Wallace, J. C., Chen, G., & Kanfer, R. (2005, April). *Development and validation of a work-specific measure of regulatory focus.* Paper presented at the 20h Annual Conference of the Socieyt for Industrial/Organizational Psychology, Los Angeles, CA.

Wilkinson, A. (1998). Empowerment: theory and practice. *Personnel Review, 27,* 40-56.

Williams, K., Harkins, S., & Latane, B. (1981). Identifiability as a deterrent to social loafing: Two cheering experiments. *Journal of Personality and Social Psychology, 40,* 303-311.

Zacharatos, A., Barling, J., & Iverson, R. D. (2005). High-performance work systems and occupational safety. *Journal of Applied Psychology, 90,* 77-93.

Zohar, D. (1980). Safety climate in industrial organizations: theoretical and applied implications. *Journal of Applied Psychology, 65,* 96-102.

Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology, 85,* 587-596.

Zohar, D. (2002). Modifying supervisory practices to improve subunit safety: A leadership-based intervention model. *Journal of Applied Psychology, 87,* 156-163.

Zohar, D. (2003). Safety climate: Conceptual and measurement issues. In J. C. Campbell & L. E. Tetrick (Eds.), *Handbook of Occupational Health Psychology* (pp. 123-142).

Zohar, D., & Luria, G. (2004). Climate as a social-cognitive construction of supervisory safety practices: Scripts as proxy of behavior patterns. *Journal of Applied Psychology, 89,* 322-333.

CURRICULUM VITAE

Michael T. Ford graduated from Charles W. Baker High School in Baldwinsville, New York in 1998. He received his Bachelor of Arts from Hamilton College in 2002. He has been employed as a research fellow for the Consortium Research Fellowship Program and as a research associate for Personnel Decisions Research Institutes and Fors Marsh Group. He received his M.A. and Ph.D. from George Mason University in 2004 and 2008, respectively.

Selected Publications

Ford, M. T., & Tetrick, L. E. (in press). Safety motivation and human resource management in North America. *International Journal of Human Resource Management*.

Tetrick, L. E., & Ford, M. T. (in press). Health protection and promotion in the workplace: A review and application of value and regulatory focus perspectives. *International Review of Industrial-Organizational Psychology*.

Ford, M. T., Heinen, B. A., & Langkamer, K. L. (2007). Work and family satisfaction and conflict: A meta-analysis of cross-domain relations. *Journal of Applied Psychology, 91,* 57-80.

Tetrick, L. E., & Ford, M. T. (2007). Health, safety, and human resource management. In S. Werner (Ed.), *Managing Human Resources in North America: Current Issues and Perspectives* (pp. 85-100). Oxford: Routledge.