

**Exploring Personal Responsibility for Participation in Organizational Processes:
Antecedents and Consequences**

Jason P. DePasquale

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E. Scott Geller, Chair
John Donovan
Jack W. Finney
Roseanne J. Foti
Neil M.A. Hauenstein

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(ABSTRACT)

Structural equation modeling procedures were used to further the current understanding of the construct “personal responsibility”. Broadly defined, personal responsibility is a state in which an individual feels a sense of obligation to a situation or event (Cummings & Anton, 1990; Dose & Klimoski, 1995). Behaviors performed due to personal responsibility are performed for internal as opposed to external reasons. It was hypothesized that feelings of personal responsibility could be influenced by both individual (interdependent self-construal, group cohesion, and trust) and organizational (personal control) variables. More so, it was proposed that employees’ feelings of personal responsibility would be significantly associated with participation in an organization’s safety process.

Participants were 219 employees of a bearings plant located in southwest Virginia. Only one variable, trust in management, predicted employee feelings of personal responsibility to participate in a behavior-based safety (BBS) process. Contrary to expectations, in the structural model there was no significant relationship between feelings of personal responsibility to be involved in the process and levels of involvement ($\beta = .24$). Involvement in the current investigation was assessed with two self-report survey items and by tracking employee observations performed with a critical behavior checklist (CBC).

Interestingly, feelings of personal responsibility was predictive of safety observations performed, as well as self reported involvement in the process, when these two involvement variables were looked at in *separate* regression equations. Furthermore, personal responsibility was predictive of these variables over and above the similar variable conscientiousness.

The current study also investigated the impact of voluntary participation in a behavior-based safety process on frequency of safe behavior performance, both on the job and while driving. Unfortunately, the number of employees participating in the process was minimal ($n = 7$). A visual inspection of the data did not indicate any apparent changes in self-reports of safe behavior for either work-related or driving behaviors as a function of participation in the safety process.

In conclusion, the current investigation can be considered an initial step in the empirical study of the personal responsibility construct. It is suggested that a number of relationships may not have been found because of the short-term nature of the current project. Future research is needed that is more longitudinal in nature.

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Introduction

In their paper on motivation and work design, Hackman and Oldham (1976) introduce a model for work motivation that suggests certain job characteristics such as task identity, task significance, and autonomy are likely to facilitate employees' perception of personal responsibility for their work processes. Since their introduction of the personal responsibility concept, researchers and practitioners alike have acknowledged the potential benefits an organization might achieve should they employ individuals who manifest personal responsibility for participation in organizational processes.

Personal responsibility is defined as a state in which an individual feels a sense of obligation to a situation or event (Cummings & Anton, 1990; Dose & Klimoski, 1995). Behaviors performed due to personal responsibility are performed for internal as opposed to external reasons. Such behaviors are considered self-directed in the behavior management literature (Watson & Tharp, 1993). As an example, consider two hypothetical employees, Employee A and Employee B. Both employees have perfect attendance at their respective organizations. However, their reasons for perfect attendance are different. Employee A reports to work everyday because he knows perfect attendance is rewarded at the end of each year with a substantial monetary bonus. In contrast, while no such reward is available at Employee B's organization, this individual feels that consistent work attendance is simply the right thing to do. In the scenario just described, Employee A is being influenced by the external contingencies put into place by management. In contrast, Employee B is attending regularly because of feelings of personal responsibility.

Responsible behaviors are self-directed and not driven by an external accountability system (Geller, 1998a). Such behavior is proposed to be more reliable (Cummings & Anton,

1990). In other words, it is expected that employees who feel personal responsibility for organizational processes will perform behaviors to facilitate the process in the absence of external motivators or directives. Additional research indicates employees who feel personal responsibility for organizational processes are also more concerned about output quality (Hackman & Oldham, 1976). Given the definition of personal responsibility and its accompanying benefits, the identification of variables that can potentially facilitate such feelings is a meaningful endeavor (Cummings & Anton, 1990; Dose & Klimoski, 1995).

Empirical investigation of the personal responsibility construct, however, has not been extensive. Thus, many questions remain regarding the determinants of personal responsibility. For example, research has not addressed the role of individual characteristics in the development of personal responsibility. It may be that some employees, due to a personality characteristic, are more likely to feel personal responsibility for their work processes and become self-directed in their work assignments. The identification of individual factors related to personal responsibility could lead to a better understanding of underlying psychological mechanisms. Plus, increased understanding of person factors contributing to personal responsibility could suggest ways to develop, increase, or support this desirable state.

The identification of environmental variables related to feelings of personal responsibility could also be useful. For example, given that some form of accountability or control system must be present in any complex organization, what steps can be taken to maximize employees' feelings of personal responsibility? Many accountability systems do not increase personal responsibility for completing a work process. Instead, they focus employee attention on external reasons for task performance. In these situations behaviors are

performed essentially to gain a reward or avoid a penalty, not because of internal feelings of personal obligation or responsibility.

Non-Mandated Work Processes

The need to facilitate feelings of personal responsibility to participate in organizational processes may be even more critical when one considers behaviors *not* mandated by the organization, or work processes comprised of voluntary behaviors. Such behaviors have been studied in organizational settings under a variety of labels. For example, Organ (1988) called this class of behaviors organizational citizenship behavior (OCB). Borman and Motowidlo (1993) referred to such activities as contextual performance. Other names used to identify this type of behavior include organizational spontaneity (George & Brief, 1992), prosocial organizational behavior (Brief & Motowidlo, 1986), discretionary organizational behaviors (Katz & Kahn, 1978), and actively caring (Geller, 1996).

Each conceptual label generally denotes behavior that goes beyond specified role requirements. These are typically behaviors employees are not formally required to perform, nor do they necessarily expect to receive tangible rewards for engaging in them. Specific examples of this type of behavior could include volunteering to do extra work assignments, helping coworkers with personal problems, suggesting procedural or administrative improvements, completing a “near miss” incident report, following rules and procedures even when inconvenient and unsupervised, and openly espousing and defending an organization’s objectives. Often performance of these behaviors is hypothesized to be integral to effective organizational functioning (Brief & Motowidlo, 1986; Katz, 1964; Katz & Kahn, 1978).

Support for the separation of this class of behaviors from task performance can be found in the research literature (e.g., Borman, White, & Dorsey, 1995; Conway, 1999; Motowidlo & Van Scotter, 1994). In a study performed by Motowidlo and Van Scotter (1994), supervisors at an U.S. Air Force base were asked to rate 421 mechanics on their task performance, contextual performance, and overall performance. The findings obtained from this investigation indicated that task performance and contextual performance contributed independently to overall performance.

Moreover experience was more highly correlated with task than contextual performance, and personality variables were more highly correlated with contextual than task performance. These results were interpreted by the authors as support for a distinction between task performance and contextual performance.

A meta-analysis across 14 studies conducted by Conway (1999) also supports the notion that contextual performance contributes uniquely to performance ratings. Unlike the Motowidlo and Van Scotter (1994) investigation this study focused on the impact of contextual performance on job evaluations for individuals in managerial jobs. It was found that job dedication (a facet of contextual performance) contributed uniquely to evaluations of overall performance. Also, the job dedication - performance evaluation was stronger when peers were doing the performance ratings. Supervisors paid more attention to task performance.

Behavior-Based Safety

One domain that provides ample opportunity for empirical investigation of the relationship discussed above is the domain of behavior-based safety or BBS (Geller, 1996, 1998b). In general, when organizations implement a BBS process, participation is voluntary.

As a result, behaviors supporting a BBS process are performed at the employee's discretion. In essence, these behaviors are analogous to the non-mandated work processes discussed above. Examples of such behavior include performing a BBS observation, allowing a fellow employee to observe one's work practices, giving individual feedback or recognition, attending extra BBS meetings, performing a component of safety self-management (Geller, 1998a), or offering suggestions for improving a BBS process. The current investigation proposes that if an organization can facilitate feelings of personal responsibility to participate in a BBS process, participation in the process will increase.

H1: Personal responsibility to engage in behaviors that support a BBS process will be directly related to amount of actual BBS-related behaviors. Specifically, the greater an employee's personal responsibility to participate in a BBS process, the greater will be the number of participation behaviors.

While it is presumably advantageous for an organization to promote feelings of personal responsibility for participating in organizational processes, or in this case a BBS process, there is limited empirical investigation of factors that contribute to personal responsibility in a work setting. As such, the *primary* purpose of the present investigation was to identify factors, both individual and organizational, that facilitate employees' sense of personal responsibility for voluntary participation in an organizational process.

Group Cohesion

Researchers have frequently considered cohesion to be an important component of group processes and performance (Baumeister & Leary, 1995; Gully, Devine, & Whitney, 1995). Although many variations in the definition of group cohesion exist, most include a member's desire to remain part of the group. More

specifically, theory suggests individuals who perceive themselves to be part of a cohesive group are more strongly motivated to contribute to the group's welfare, advance its objectives, and participate in its activities (Cartwright, 1968).

With regard to a relation between group cohesion and personal responsibility for participation in a BBS process, a number of researchers have concluded stronger group cohesion generally means a higher degree of interaction and personal responsibility among members of a group (Cartwright, 1968; Martin & O'Laughlin, 1984). Unfortunately, no research could be located that directly tested this assertion. The current research hypothesized that group cohesion would directly influence employees' development of personal responsibility for participating in organizational processes, particularly if the processes are beneficial to group members, as is the case with a BBS process.

Spink (1995) performed two studies to investigate the role of group cohesion among both recreational and elite female athletes as a determinant of intentions to participate as a team member. In both studies, participants completed the Group Environment Questionnaire at the completion of the sport season. Findings from both studies indicated that an athlete's perception of cohesion with team members was significantly associated with intentions to continue playing with the team in future seasons.

In another relevant experiment, Cervin (1956) manipulated group solidarity of three person groups by having confederates agree or disagree with opinions expressed by the experimental participant. Findings indicated that average degree of participation in discussion was greater in the high cohesion situations. Cartwright (1968) also discusses the impact of group cohesion on group activities. In particular, Cartwright states, "since cohesiveness contributes to a group's capacity to retain members and exert influence over them, we might expect it also to result in a heightening of participation in group activities (p. 104)."

Schoenrade, Batson, Brandt, and Loud (1986) gave 40 female undergraduates a choice between helping themselves or helping another undergraduate female with whom they either had or did not have a prior relationship. As predicted, in the absence of any prior relationship, an accountability manipulation was necessary to increase behaviors beneficial to the other woman. However, when a prior relationship existed, no accountability mechanism was needed for the helping behaviors to occur. This research clearly supports the notion that the tendency to become involved with or help others in distress is related to personal feelings of responsibility to those individuals (Pearce & Gregersen, 1991).

In sum, the relation between group cohesion and participation behaviors in a group setting is well-established (Brief & Motowidlo, 1986; Clark, 1981). However, the underlying processes responsible for these findings have not been empirically determined. In agreement with prior research (Cartwright, 1968; Martin & O’Laughlin, 1984), the theory proposed in the current study offers the construct of personal responsibility as a variable mediating group cohesion and participation in organizational processes, particularly those processes that involve performance of behaviors beneficial to group members.

H2: Group cohesion will directly affect personal responsibility for participating in organizational processes. That is, individual’s who perceive more group cohesion will also report a greater feeling of personal responsibility to participate in a BBS process.

Interpersonal Trust

In addition to group cohesion, the current study proposes interpersonal trust will also play a critical role in facilitating personal responsibility for participation in a BBS process. The

concept of trust refers to the extent that a person ascribes good intentions to others and has confidence in their competence (Cook & Wall, 1980).

Little research has examined the direct impact of interpersonal trust on performance (McAllister, 1995). However, researchers have long recognized trust as a hallmark of favorable or high-quality relationships (Hart, 1988; Zand, 1972). And a positive influence of trust on coordination and personal control has been shown at the institutional (Shapiro, 1987) and interpersonal (Granovetter, 1985) levels of an organization. In fact, trust between individuals and groups within an organization is a critical ingredient in the long-term stability of an organization and the well being of its members (Cook & Wall, 1980). In other words, it is generally agreed that high levels of interpersonal trust are beneficial for effective organizational functioning.

In recent research particularly relevant to the current study, DePasquale & Geller (in press) found trust to be an important variable in determining employee participation. They surveyed 20 different organizations currently using a BBS process. The aim was to identify variables that predict amount of employee participation in a BBS process. A regression analysis indicated that trust in management's abilities to support BBS was predictive of self-reported involvement in the BBS process.

As with relations between group cohesion and personal responsibility, the link between interpersonal trust and personal responsibility has not been directly researched. However, given what we know about these constructs, a causal relationship seems probable. For example, Dose and Klimoski (1995) assert that if an interpersonal relationship does not include trust, or if an employee perceives management or a coworker acting only for personal gain, no accountability system is likely to produce personal responsibility for participating in

the process. In other words, it is more likely an individual will feel personally responsible to participate in organizational processes if a trusting relationship exists among the individuals involved (Dose & Klimoski, 1995).

Yamagishi and Cook (1993) performed two studies to investigate the impact of interpersonal trust on individual participation in exchange relationships. In both experiments, support was found for the notion that interpersonal trust elevates an individual's level of participation in a group situation. In fact, several studies point to the beneficial impact of interpersonal trust on frequency and quality of group member interaction as well as participation in decision-making events (Samuelson, Messick, Rutte, & Henk, 1984; Sato, 1988).

In sum, both group cohesion and interpersonal trust are variables that have been linked positively to increased levels of interaction and participation in group settings. The theory proposed here is that these two variables result in such increases because they increase an individual's feeling of personal responsibility to engage in these behaviors, particularly if the behaviors are beneficial for group members. In other words, personal responsibility is hypothesized to be a mediator between cohesion and interpersonal trust, and subsequent participation in a BBS process.

H3: Trust in coworkers will directly affect personal responsibility for participating in organizational processes. That is, individuals reporting higher levels of trust in their coworkers will also report greater feelings of personal responsibility to participate in a BBS process.

H4: Trust in management will directly affect personal responsibility for participating in organizational processes. That is, individuals reporting higher

levels of trust in management will also report greater feelings of personal responsibility to participate in a BBS process.

While indicating that cohesive and trusting relations are conducive to personal responsibility, it is also important to identify personality characteristics and organizational processes that can help to build group cohesion and interpersonal trust. By doing so, organizations can be better equipped to advance a culture propitious to employees feeling personal responsibility to participate in organizational processes.

Self-Construct

A particular individual difference variable that holds promise as a potential antecedent to feelings of both group cohesion and interpersonal trust is an individual's self-construct. Self-construct is conceptualized as a constellation of thoughts, feeling, and actions concerning one's relationship to others and the self as distinct from others (Singelis, 1994). Researchers in cross-cultural psychology have long maintained that one's view of the self in relation to others is critical to understanding individual perceptions, evaluations, and behaviors (Gardner, Gabriel, & Lee, 1999; Markus & Kitayama, 1991; Singelis, 1994; Triandis, 1989). Specifically, how we perceive ourselves in relation to others can have a tremendous impact on how we interact with colleagues or coworkers (Markus & Kitayama, 1991). Plus, the extent to which people value individual versus collective goals in human life has important consequences for their lifestyle, interpersonal relationships, and psychological well-being (Hui & Villareal, 1989).

Traditionally, cross-cultural research has focused efforts on examining differences between societies with an interdependent (e.g., Japan and other far-eastern countries) versus

independent (e.g., United Kingdom, United States) culture. Recently however, evidence supports the assertion that there is a coexistence of independent and interdependent selves within a cultural group (Singelis & Brown, 1995; Trafimow, Triandis, & Goto, 1991).

An interdependent self-construal is defined as a self that emphasizes relationships, belonging and fitting in, as well as occupying one's proper place in a group. In other words, fitting in and connecting with others are primary motivating factors for people with an interdependent self-construal. Harmonious interpersonal relationships and the ability to adjust to various situations are sources of self-esteem (Singelis, 1994). Contrary to the independent self, the interdependent self depends on relations with others and contextual factors to regulate behavior (Singelis & Brown, 1995).

In contrast, individuals who possess a more independent self-construal place a greater emphasis on their own internal thoughts and abilities, promoting their personal goals, being unique and expressing themselves (Singelis & Brown, 1995). When thinking about the self, individuals with an independent self-construal are more likely to use their own skills, abilities, and goals as a referent than they are to take into account the thoughts feelings and actions of others (Singelis, 1994).

Research has documented that many aspects of social preferences and behaviors can be linked to the self-construal construct (Gardner et al., 1999; Triandis, Botempo, Betancourt, et al., 1986). For example, individualists have been found to possess a higher need or preference for autonomy, whereas collectivists show greater belonging, nurturant, and succorant needs (Hui & Villareal, 1989). In addition, Triandis, Leung, Villareal, and Clack (1985) found idiocentrism (i.e., an emphasis on personal goals and views) to relate to higher achievement motivation as well as to greater feelings of loneliness, alienation, and anomie.

Predictions of behavioral patterns from these constructs have also been successful (Triandis & Gelfand, 1998). Wheeler, Reis, and Bond (1989) used the Rochester Interaction Record (RIR) to investigate the effects of individualism-collectivism on everyday social interactions. To accomplish this, university students in the U.S., an individualistic country, and Hong Kong, which is more collectivistic, maintained the RIR for a two-week period. As predicted, compared to U.S. students, the Hong Kong students had longer but fewer interactions with fewer people. They communicated primarily with in-group members. Hong Kong students also indicated greater self and other-disclosure during their interactions. From this study it was concluded that individualistic cultures are more likely to be composed of superficial relationships.

Interdependence and Group Cohesion

Although numerous researchers have documented a direct relationship between task interdependence and group cohesion (Gully, Devine, & Whitney, 1995), few have investigated the impact of interdependence as an individual difference variable on actual experiences with group cohesion in a work setting. The current research studied whether an interdependent self-construal leads to differences in perceived levels of cohesion in a group setting. In particular, it is hypothesized that individuals who are more interdependent in their self-construal will be more likely to establish cohesive relationships in their work group than individuals with an independent self-construal. To the extent such a relation is found between these variables, interdependent individuals will also manifest greater feelings of personal responsibility to participate in organizational processes.

Several researchers provide support for the proposed causal relationship. In particular, Triandis et al. (1988) conclude that people living in more interdependent cultures are more apt

to develop friendships that imply a life-long intimate relationship with many obligations. So the quality of a friendship varies according to the interdependence of a culture. Further, research in the domain of self-psychology (Kohut, 1984) has demonstrated that individuals will tend to seek out relationships that confirm their world-view (Gardner et al., 1999; Lee & Robbins, 1998; Miller, 1992). Interdependent individuals are more likely to view their world as a social system, and to possess a stronger need to be a part of this system than their independent counter-parts. Thus, to the extent an individual has an interdependent world-view, they will be more likely to pursue relationships that satisfy their need to be part of a cohesive social network.

From a survey of 185 students at a large, urban southeastern university, Lee and Robbins (1998) found that women who reported feeling more distant from the social world were less likely to attempt to satisfy their need for belonging. Hui and Villareal (1989) report similar findings. Using participants from both the U.S. and Hong Kong, the authors demonstrated consistent differences between individuals with a collectivistic world-view versus those with an individualistic perspective. Specifically, individualism was positively correlated with a need for autonomy, and negatively correlated with needs for abasement, affiliation, nurturance, succorance, and desirability. Similar correlational patterns were found for participants in Hong Kong as well as the U.S.

Interdependence and Interpersonal Trust

With regard to interpersonal trust, specific research investigating the nature of interpersonal trust and its antecedents has identified interdependence as a potential causal variable (Kumar, Scheer, & Steenkamp, 1995). In other words, a number of investigators

have hypothesized that all else being equal, interdependence and trust covary in an interpersonal relationship. Unfortunately, the majority of the group-cohesion research investigating relations between interdependence and trust has focused on task or work relationship characteristics as opposed to individual differences. For instance, using survey data from automobile dealers, Kumar, Scheer, and Steenkamp (1995) found that as perceived interdependence asymmetry increased, dealer trust and commitment declined. In addition, relationships with greater total interdependence exhibited higher trust, stronger commitment, and lower conflict than relationships with lower interdependence.

Kumar et al. (1995) examined interpersonal relationships from a contextual or structural perspective, and the characteristics of the individual participants were not assessed. For the current investigation it was presumed that if an individual enters into a social situation with a pre-disposition for developing a more interdependent relationship (based on their self-construal), they will be more likely to initiate and sustain such a relationship than will individuals with an independent self-construal.

Given the differences found between people with an interdependent self-construal versus an independent self-construal, a mediated relation is proposed between an individual's self-construal and subsequent feelings of personal responsibility in organizational processes. In particular, it is hypothesized that an interdependent self-construal sets an establishing condition that motivates an individual to establish cohesive and trusting relationships with coworkers. In turn, as discussed previously, elevated levels of cohesion and trust will help to facilitate perceptions of personal responsibility for participating in organizational processes.

H5: An interdependent self-construal will have indirect effects on personal responsibility for participating in organizational processes. That is, individuals

with an interdependent self-construal will report more cohesive relationships with their coworkers. In turn, as previously hypothesized (H2), group cohesion will directly influence personal responsibility to participate in the BBS process.

H6: An interdependent self-construal will have indirect effects on personal responsibility to participate in organizational processes, due to its influence on interpersonal trust in coworkers. That is, individuals with an interdependent self-construal will report more trusting relationships with their coworkers. In turn, as previously hypothesized (H3), trust in coworkers will directly influence personal responsibility to participate in a BBS process.

Personal Control

Up to this point, the primary focus has been on how individual differences can facilitate the development of relationships more conducive to feelings of personal responsibility to participate in organizational processes. It is proposed that some individuals bring with them a greater propensity for personal responsibility than do others. In addition to individual differences, it is further proposed that organizations can facilitate feelings of personal responsibility for participation in organizational processes by providing employees with greater levels of personal control over those processes.

All complex organizations incorporate some form of control system to provide guidelines for managing employee behavior (Dose & Klimoski, 1995; Katz & Kahn, 1978). Traditionally, views of organizational control have stressed mechanisms such as rules, hierarchies, and sanctions, making use of what has been called process control and output control strategies (Ouchi, 1977).

One of the weaknesses associated with traditional bureaucratic control systems is that such mechanisms do not give organizations the flexibility to react in a timely manner to changes in a dynamic business environment. As Mitchell (1993) states “tall and formal chain of command organizations are proving to be unwieldy and unable to meet the customer-dictated necessity of adroitness, flexibility, and adaptability (p.36).”

Second, rigid hierarchical control systems necessarily inhibit employee autonomy and personal control. To the extent employees desire some discretion in their work environment, a reduction in these factors can lead to employees engaging in resistance behaviors. For example, false-reporting behaviors have been associated with monitoring systems that produce constant vigilance for the purpose of control over production (Grant, Higgins, & Irving, 1988) or management standards that employees perceive as unreasonably high (Dose & Klimoski, 1995).

In addition, research by Kelman (1958) suggests that organizations relying solely on traditional management-driven control policies will find their employees more likely to engage in compliance behaviors. But, compliance behavior tends to produce defensive strategies and a motivation to avoid punishment (Dose & Klimoski, 1995). Individuals perform the behavior only because they know they are being monitored and not because they agree with organizational policies. Such negatively reinforced behavior presumably decreases perceptions of individual freedom (Skinner, 1971). In these situations, people feel accountable but not personally responsible (Geller, 1998a).

Much research has demonstrated benefits associated with elevated levels of personal control. For example, organizational structures which give employees greater discretion in job performance have been found to be positively related to employee perceptions of fairness,

satisfaction, quality of work life, and organizational effectiveness (Hackman & Lawler, 1971; Hunton, Hall, & Price, 1998; Sashkin, 1984). In contrast, a lack of control over organizational outcomes may result in a state of learned helplessness (Seligman, 1975). In other words, employees are said to have “trained incapacity” in that all decisions are made for them rather than being encouraged to do so on their own (Dose & Klimoski, 1995).

Personal control in the context of self-management programs does not imply external control is irrelevant (Dose & Klimoski, 1995). Instead, the intent is to partially close the gap between the “doing” and the “controlling” aspects of the job. In this sense, increases in personal control are established by *vertically loading* a task or job (Hackman & Lawler, 1971). When a job is vertically loaded, responsibilities and controls that formerly were reserved for management are given to employees. Vertically loading a job inevitably increases autonomy. Subsequently, it is often found that employees in this situation will view task demands more favorably because they feel they are being treated with respect rather than simply being monitored (Cummings & Anton, 1990; Geller, 1998a).

A number of researchers have provided evidence that increases in personal control leads to employee personal responsibility (Dose & Klimoski, 1995). For example, through surveying 658 employees from 62 different jobs in seven organizations, Hackman and Oldham (1976) found significant positive correlations not only between employee perceptions of autonomy and personal responsibility, but also between autonomy and job involvement.

In another relevant investigation, Fisher (1978) recruited participants through a “help wanted” advertisement for a short-term clerical job. He then directly manipulated subjects’ personal control regarding effective task performance. More specifically, individuals in a high personal control condition were assigned a puzzle task in which their effort could influence

task outcome. Those relegated to the low personal control condition were assigned a puzzle task in which their efforts were meaningless for success. In fact, successful performance was almost impossible in this condition. Results indicated that one's level of personal control was directly correlated with self-report and behavioral measures of internal motivation to perform the task. As a result of prior research, the current study hypothesized that elevated levels of employee personal control would increase personal responsibility to participate in organizational processes.

H7: Personal control will directly affect personal responsibility to participate in a BBS process. That is, employees assigned to a personal control condition will report higher levels of personal responsibility to participate in a BBS process than will individuals in a control condition.

Personal Control and Interpersonal Trust

In addition to the expected direct affect of personal control on personal responsibility, indirect effects were also predicted. Specifically, it was hypothesized that elevating levels of employee personal control over organizational processes would lead to increases in employee trust in management. In turn, increased feelings of trust in management would enhance employee personal responsibility to participate in organizational processes.

Often employees perceive management to be establishing a system whereby individual employee behavior is monitored for the sole purpose of keeping tabs on everyone. Due to these perceptions, employees do not develop personal responsibility for participating in organizational processes. Instead, employees participate only to avoid negative sanctions associated with non-participation. Any improvement program needs trust between

management and workers (Mitchell, 1993). To gain this trust, it is suggested management allow employees control over the design and improvement of their work processes.

An atmosphere of trust between management and employees fosters the development of personal responsibility. However, promoting responsibility of this type requires less frequent monitoring on the part of management (Dose & Klimoski, 1995). In other words, if it is desirable for employees to develop trust in management intentions and subsequently personal responsibility, management needs to enable employees to have more control over their work processes. To cultivate personal responsibility, companies need to let their employees plan and control their own work to some extent (Mitchell, 1993).

To investigate the personal control/trust in management relationship, Deci, Connell, and Ryan (1989) collected survey data from 23 managers and their subordinates in a large corporation. Their results showed that managers' orientations coordinated significantly with certain subordinate variables. In particular, subordinates of managers who provided a context for promoting a sense of self-determination, reported significantly higher levels of trust for their management. The results are consistent with proposals that discuss the importance of understanding and acknowledging individual needs, feelings, and attitudes with respect to situations at hand. When such needs are met, the target person will be more trusting of the context, and hence more likely to perform the desired behaviors (Deci et al., 1989).

Magner, Welker, and Johnson (1996) report additional support for the influence of personal control on subsequent perceptions of trust. Questionnaire data from 220 academic accountants showed that supervisors who let employees offer input into decision-making processes were more likely to be trusted than supervisors who did not let employees provide input for process decisions.

Finally, Jenkins and Lawler (1981) investigated the impact of allowing employees in a small manufacturing firm more control in the development of a base-pay plan. Attitudinal data (including a trust-in-management scale) and behavioral data were collected from 58 employees prior to, and immediately following the development and installation of the pay plan. The results showed a significant increase in employee trust in management after the next pay schedule. Allowing employee input not only resulted in more effective pay plans, but also led to a better overall relationship between employees and management.

H8: Personal control will indirectly affect personal responsibility to participate in organizational processes, through its influence on employee trust in management. That is, employees in a personal control condition will report higher levels of trust in management than will employees in a control condition. In turn, trust in management will be associated with increases in personal responsibility to participate in a BBS process.

Personal Responsibility or Conscientiousness

The primary aim of the present investigation was to identify factors that facilitate employee feelings of personal responsibility to participate in organizational processes. The underlying assumption is that a feeling of personal responsibility is a very powerful determinant of actual performance. In this particular instance, the concern is with employee personal responsibility for participation in a non-mandated work process.

Several variables have demonstrated ability to predict this class of behavior. Noteworthy among such variables is conscientiousness, a variable that has predicted not only OCB, but has also been consistently related to job performance across a wide variety of occupational groups (Crant, 1995). Broadly defined, conscientiousness is a trait described as a stable tendency to be organized, efficient, goal oriented, and persistent (Barrick & Mount, 1991; Costa & McCrae, 1992; Goldberg, 1992).

The conscientious variable is particularly noteworthy for two reasons. For one, as mentioned above, conscientiousness has predicted OCB in previous research. For example, Hogan, Rybicki, Motowidlo, and Borman (1998) had 214 job applicants complete the Hogan Personality Inventory (HPI). Subsequently, employees were rated by their supervisors for OCB performance. Results indicated that conscientiousness, as measured by the HPI Prudence score, was significantly related to supervisory ratings of employee OCB.

In addition, it might be argued that personal responsibility is nothing more than a factor subsumed by conscientiousness. In fact, The Jackson Personality Inventory (JPI) includes a responsibility factor in its conscientiousness dimension. If personal responsibility is subsumed by conscientiousness, it would seem unnecessary for an organization to be concerned with structuring an environment that breeds feelings of personal responsibility. It would probably be much easier to employ individuals high on the conscientiousness trait.

As defined in the current study, personal responsibility is proposed to be distinct from conscientiousness. Several arguments support this perspective. First, with regard to the JPI, Paunonen and Jackson (1996) report on findings indicating the responsibility scale had its chief loading on the agreeableness factor rather than the conscientiousness factor (Costa & McCrae, 1998).

Second, conscientiousness is traditionally defined as a stable trait that remains constant across time and environment. In contrast, personal responsibility is defined in this investigation as a state, directed at a specific organizational process, and subject to influence both by environmental and individual difference variables. Said differently, it is perfectly logical to imagine people being goal-driven, organized, prompt, and neat (i.e., conscientious), but not feeling obligated to participate in a particular voluntary work process - they do not feel any personal responsibility to contribute.

H9: Employee feelings of personal responsibility will be predictive of participation in the BBS process over and above individual levels of conscientiousness.

Consequences of Voluntary Participation in a Behavior-Based Safety Process

Individuals who become actively involved in a behavior-based safety (BBS) process are necessarily endorsing a certain class of behaviors - - safety-related behaviors. Their public endorsement of safe behavior leaves them susceptible to negative consequences when performing at-risk behaviors. Specifically, aversive consequences may be public (disapproval from others for inconsistency between verbal and work behaviors), or private (anxiety, guilt, or perhaps cognitive dissonance). In other words, an individual who is active in a BBS process, but consistently performs at-risk behaviors should experience induced hypocrisy (Aronson, Fried, & Stone 1991).

A study by Aronson et al. (1991) took advantage of the induced hypocrisy concept to promote safer sex practices. In this experiment feelings of hypocrisy were induced in college students to increase condom use. Hypocrisy was created by making students mindful of their

past failure to use condoms and then having them persuade others about the importance of condoms for AIDS prevention. The induction of hypocrisy led to a greater intent to improve condom use relative to control conditions. In addition to an increase in intent to use condoms, when contacted several months later, subjects in the induced hypocrisy condition reported having used condoms at a greater rate than subjects in the control condition.

Further support for hypocrisy-induced behavior change was documented by Dickerson, Thibodeau, Aronson, and Miller (1992). Dickerson et al. tested the phenomenon in a field experiment on water conservation. Experimenters aroused hypocrisy in patrons of a campus recreation facility by making them feel hypocritical about their showering habits. They made participant's aware that they had sometimes wasted water while showering, and then varied whether or not participants made a public commitment by urging other people to take shorter showers. As expected, participants in the hypocrisy condition took significantly shorter showers than individuals in the control condition.

Finally, Ludwig and Geller (in press) investigated the behavioral impact of serving as an intervention agent on subsequent behaviors. Using pizza deliverers as intervention agents for a community safety-belt campaign, the researchers found that participating deliverers increased their own safety belt use 32% over baseline levels. In contrast, deliverers at a control side did not demonstrate any concomitant increases in safety-belt use. Also noteworthy was that the deliverers acting as intervention agents exhibited significant increases in their use of turn signals, suggesting a spread of effect to another safety-related behavior as a result of becoming an intervention agent.

In sum, it is expected an increase in safe working behaviors will accompany an increase in voluntary contributions to a BBS process. In addition, it was hypothesized that

increases in the performance of safe behaviors will extend beyond the work environment. In other words, it is proposed that individuals participating voluntarily in a BBS process will also exhibit an increase in safe behaviors at home and driving their car.

H10: Individuals who perform more behavioral observations of their coworkers will demonstrate increases in their own safety-related behaviors at work.

H11: Individuals who perform more behavioral observations of their coworkers will demonstrate increases in their own safety-related behaviors in contexts outside of work (i.e., while driving a vehicle).

A Proposed Model for Personal Responsibility

Based on Hypotheses 1-8, a model for personal responsibility has been developed and is displayed in Figure 1. The theoretical relationships discussed above are indicated in the model by arrows drawn from one variable to the variable it is hypothesized to influence. Each path is marked to indicate the hypothesis it is meant to represent.

Insert Figure 1 about here

Competing models

When analyzing latent variable models, researchers recommend testing the hypothesized model against competing structural models (MacCallum, 1998). Competing models are used to assess the relative fit of a hypothesized model. The current investigation offers two alternative models to the one hypothesized. The first alternative model is an unconstrained model similar to the hypothesized model except the paths from interdependent

self-construal, personal control, group cohesion, trust in coworkers, and trust in management to participation in the BBS process are set free.

The second alternative model, the constrained model, is also similar to the hypothesized model. In the constrained model the path from personal control to feelings of personal responsibility is fixed at zero. Figures 2 and 3 display the unconstrained and constrained model (respectively) investigated in the current investigation.

Insert Figures 2 and 3 about here

Method

Participants and Setting

Participants were 219 employees of a bearings plant located in southwest Virginia. They ranged in age from 18 to 61 with a mean of 34. There were 71 females, 138 males, and 10 individuals who did not identify their gender. Participants had been employed by the organization an average of 25 months (range = 1 to 120 months). The study took place in the context of a new BBS process. At a minimum all employees were required to attend a three-hour training session. Any participatory behaviors performed by the employees after the training sessions were at the employees' discretion.

Measures

Most surveys consisted of five-point Likert scale items ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The conscientiousness survey consisted of a nine-point scale ranging from 1 (*not at all like me*) to 9 (*very much like me*). All of the surveys used are included in Appendix A.

Personal control manipulation. Based on a review of the personal control literature, items were developed specifically to assess the degree to which employees perceived they have had the opportunity to influence the design and implementation of the BBS process. The survey asked the following questions: a) How many BBS observations should be performed per individual on a weekly basis? b) Would it be acceptable to have employees do observations for jobs other than their own? c) Are there any specific suggestions you can make that you feel would improve the safety process? d) Do you feel it is acceptable for management level employees to do observations with the checklist? And e) Is there anything you think should be added to, or removed from the observation checklist?

Personal control manipulation check. Three items were used to assess the impact of the personal control manipulation: a) I feel I have had an opportunity to influence decisions regarding the specifics of our behavior-based safety process. b) I do not feel I have had the opportunity to give input regarding how the behavior-based safety process is going to look. And c) Several aspects of the behavior-based safety process are in part a result of my input.

Interdependence. Interdependence was measured with the 11-item scale developed by Wagner and Moch (1986). The scale assesses the extent to which an individual focuses on self versus group interests in a team context. The scale is further broken down into three dimensions. The first dimension is labeled *beliefs* (three items) and consists of three items that measure whether a work group is perceived to be more effective when working as a collective. The second dimension is called *values* (three items) and assesses an individual's preferences for working independently versus working in a more collectivistic or interdependent environment. The final dimension (five items) is labeled *norms* and measures an individual's prescriptions for how others should behave. These prescriptions may be either

interdependent or independent in nature. Reported reliabilities for this scale are all above .75 (Moorman & Blakely, 1995). Wagner and Moch (1986) have provided evidence for its construct validity.

Group Cohesion. Group cohesion was measured with nine items adapted from the scale developed by Wheelless, Wheelless, and Dickson-Markman (1982). The nine-item scale taps the “togetherness” individual members' feel towards other members in their group. It is designed to be an indicator of an individual's experienced cohesion with a group. Reliability estimates for this scale are reported at .84 (Roberts & Geller, 1995). For structural equation modeling purposes, this scale was randomly separated into three separate three-item scales. As such the group cohesion construct had three indicators.

Trust in Coworkers. Trust in peers was measured with a six-item scale developed by Cook and Wall (1980). The scale is broken down into two factors, faith in peer intentions and faith in peer abilities. The scale is intended to yield ascriptions of capability and intentions of coworkers. Reported reliabilities for this scale are all above .80 (Cook & Wall, 1980).

Trust in Management. Trust in management was measured with six items developed by Cook and Wall (1980). Similar to the items designed to measure trust in peers, the trust in management items also form two factors (i.e., trust in management intentions and trust in management abilities). Reported reliabilities for this scale are all above .80 (Cook & Wall, 1980).

Personal Responsibility for Participation. Personal responsibility was assessed with three items designed specifically for this study. Based on a review of the personal responsibility literature, the items were designed to tap the degree to which an individual feels a sense of duty or obligation to participate in a BBS process. These items are: 1) Even though

I do not have to, I feel an obligation to participate in the behavior-based safety process, 2) Even though it is not a job requirement, I feel it is part of my personal responsibility to participate in the behavior-based safety process, and 3) The only way to make me participate in the behavior-based safety process is to make it mandatory.

Conscientiousness. Conscientiousness was measured with items developed by Goldberg (1992). The scale consists of ten adjectives representative of conscientiousness and asks individuals to rate themselves on a scale from 1 to 9 for each of the adjectives. Internal consistency estimates of the scale range from .85 to .94 (Goldberg, 1992; Stewart, Carson, & Cardy, 1996)

Involvement in the BBS Process. Employee participation in the BBS process was assessed by examining the number of observations performed, and two likert-scale ratings of BBS process involvement (i.e., from 1 = not at all involved, to 5 = very involved). The self-ratings were provided by each employee eight days after all employee training had been completed. These items were: 1) How involved would you say you have been in the behavior-based safety process? and 2) Compared with your coworkers, how involved have you been in the behavior-based safety process?

Frequency of Safe Behavior Performance. Frequency of safe behavior both on the job and while driving was assessed with eight self-report questions. The first four questions (1-4) address safety related behaviors performed while on the job, and the second four (5-8) focus on safety-related behaviors performed while driving. Specifically, they included: 1) When doing my job, I make a conscious effort to follow all safety procedures, 2) During the past week, how often have you performed your job using all the required PPE? 3) During the past week, how often have your taken a shortcut that could be considered at-risk while doing your

job? 4) During the last week, how often have you performed any work behaviors that could be considered at-risk? 5) During the last week, how often have you used your safety-belt while traveling in a car? 6) During the last week, how often have you come to a complete stop at a stop sign while driving? 7) During the last week, how often have you used your turn signal when performing a turn or changing lanes? 8) During the last week, how often have you found yourself driving your car a little too closely to the vehicle in front of you? The first safety behavior assessment-item was assessed with the same five-point likert scale used for the other personality measures (i.e., from 1 = strongly disagree, to 5 = strongly agree). Items two through eight were on a five-point likert scale ranging from Never (1) to Every time (5).

Procedures

Employee Training. All front-line employees in the organization participated in a three-hour training/education class. For identification purposes, employees were instructed to use their company-assigned four-digit clock numbers. In other words, employees were told that their clock number should be placed on any paperwork (checklists or surveys) they complete that was related to the current study. Twenty-three BBS training sessions were completed over a five-day period. Attendance at the sessions range from 3 to 17.

During training, employees were educated and trained in the basic principles and methods of BBS. They learned how to perform BBS observations and complete a critical behavior checklist (CBC). All training sessions were facilitated by an advanced graduate student in psychology who had conducted many similar sessions over the prior two years. The training, was identical in content and delivery for all sessions. During the week prior to these sessions the CBC used for subsequent observations was developed with the assistance of employees (n=16) selected from varying levels of the organization.

A copy of this CBC is shown in Figure 4. As the figure illustrates, the CBC developed is separated into three columns. The column on the far left breaks down three behavioral categories targeted for observation. Each category is broken down into some specific examples so the employee doing the observation is aware of what to be looking for. For example, looking at the checklist it is evident that the required PPE includes safety glasses, safety shoes, no jewelry, and anchored hair. A space is left blank and labeled “other” in case an observer identifies an item that is missing from the checklist for that category.

The next two columns provide space for the observer to make hash marks indicating the type of behavior they have observed. In other words, if a participant is observing a coworker and notices the individual is not wearing safety shoes, a single hash mark is put in the at-risk column next to safety shoes. The last column is labeled comments, and is simply a place for the observer to make any additional notes relevant to the safety observation or the feedback session that is meant to take place after the observation. At the top of the CBC is where an observer records any demographic information the organization is interested in collecting.

Insert Figure 4 about here

Personal control manipulation. At half of the training/education sessions, the questions designed to facilitate a sense of personal control were administered to employees at the conclusion of the training session.

It was explained to employees in the personal control condition that their responses would be used to help structure the safety process for the whole plant. For groups not receiving the personal control manipulation questions, the trainers simply asked employees for their input regarding perceptions of behavior-based safety in general. In other words, after all employees

received BBS training, those in the personal control condition were afforded an opportunity to give their input regarding what the BBS process should be like. In contrast, the rest of the trained employees did not have any opportunity to give input into the process.

First survey administration. Immediately following each training session, and after the personal control manipulation was completed, a survey assessing the personality and behavioral variables of interest was distributed. Employees were given approximately 45 minutes to complete the surveys, which were collected by researchers as completed. After every employee had complete the survey, each was personally handed five CBCs and asked by the researcher to begin performing observations the day after all employees had been trained. At this point employees were free to leave.

After all training sessions had been completed, employees were reminded to participate in the process during their shift changes. Shift changes occurred at 6 am, 2 p.m., and 10 p.m. During these times, employees from a specific shift come together in one room for approximately 15 - 20 minutes for attendance and daily announcement purposes. During each of the shift change meetings, the one of the trainers stood up and told employees that CBC collection boxes were up throughout the plant, and that they could begin performing observations when they started work on the shift that day

Participation data. To assess levels of participation, four CBC collection boxes were set up at various locations throughout the plant. After observing a fellow employee and completing a CBC, the observers were instructed to write their clock number at the top of the card, and as soon as convenient drop the CBC in a data collection box. The data cards were retrieved from collection boxes at the end of the week.

Second survey administration. Eight days after BBS training, a second survey (10 items) was administered to all employees. Eight days was selected as the duration for the experimental phase based on the authors three years of experience with BBS processes in a variety of industries. Given the authors experiences, there was every reason to believe eight days would be adequate time for employees to become involved in the BBS process. The second survey was administered to each participant by the author of this paper during the shift change times described earlier. The second survey repeated eight questions asked on the first survey. Specifically, it asked employees to estimate again the frequency of certain safe behaviors occurring both on and off the job. The second survey also included the two items that asked employees to rate their level of involvement in the BBS process.

Results

Manipulation check. The three 5-point personal control items were summed to yield a scale score for personal control. This score could range from a low of 3 (no perceived personal control) to 15 (very much perceived personal control). The items demonstrated acceptable inter-item consistency ($\alpha = .75$) and the mean scale score for these three items across conditions was 9.9 (SD = .19).

A one-way ANOVA was performed to assess the effectiveness of the personal control manipulation. Results revealed participants in the Personal Control condition (n = 120) reported a mean rating of 10.4 (SD = 1.7) for perceived level of personal control. In contrast, participants in the No Personal Control condition (n = 99) reported a mean of 9.3 (SD = 1.9) for perceptions of personal control. The difference between the two groups was significant at the .05 level ($F(1,217)=18.14$ $p<.05$) demonstrating a successful personal control manipulation.

Model Testing. Table 1 displays descriptive statistics for the demographic and causal modeling variables used in the current investigation. Scale alphas are displayed for those factors consisting of more than one item. A quick scan of the table reveals adequate internal consistency for most of the scales used. Three scales did report alpha levels slightly lower than had been hoped for. In particular, the Trust in Coworker scale ($\alpha = .64$), Interdependent Norms scale ($\alpha = .61$), and Interdependent Value scale ($\alpha = .56$) have scale alphas that are less than desirable.

Insert Table 1 about here

The zero-order correlations for the demographic variables as well as variables used in the causal-modeling portion of the current investigation are displayed in Table 2. All significant correlations in the table are marked with an asterisk. It needs to be emphasized that group cohesion was measured at the individual level in the current study. Even though the level of assessment for group cohesion was at the individual level, it was suggested that it might be beneficial to assess the extent to which group members agreed regarding perceived cohesion. To that end, the author calculated the r_{wg} statistic recommended for assessing agreement with respect to group-level constructs (James, Demaree, & Wolf, 1984; Burke, Finklestein, & Dusig, 1999). As with reliability assessments, r_{wg} coefficients greater than .70 are generally considered as indicative of acceptable interrater agreement (Burke et al, 1999). For the current study, group cohesion demonstrated an $r_{wg} = .59$, indicating aggregation to the group level would probably not be wise.

Insert Table 2 about here

The proposed models were tested using structural equation modeling with maximum likelihood estimation in LISREL 8 (Joreskog & Sorbom, 1993). Assessment of model fit was determined through (a) examination of the solution, (b) measures of overall fit, and (c) comparisons with competing models.

Examination of the solution involves looking at hypothesized parameter estimates to be sure they are in the right direction and are significant. Measures of overall fit were determined using Chi Square (χ^2), RMSEA, GFI, AGFI, and CFI. A significant Chi Square indicates the model in question fits the data poorly. However, the Chi Square index is viewed with growing dissatisfaction among researchers. For instance, well-fitting models are ones that produce a small Chi-Square, or a failure to reject the null hypothesis. Also, the statistic is sensitive to small differences between observed and estimated data, particularly when the sample size is large (Breckler, 1990). In sum, it is generally recommended that this statistic not be relied upon as a sole measure of model fit (Bollen & Long, 1992).

The RMSEA gives the 'root mean square error of approximation' (Browne & Cudeck, 1993). As a rule of thumb, it is suggested values of .05 or less indicate a close fit of the model to the data in relation to the degrees of freedom (Browne & Cudeck, 1993). The GFI (goodness of fit index) was developed by Joreskog and Sorbom (1984), and indicates the relative amounts of variance and covariance accounted for by a given model. It ranges from zero to one with values of one indicating a perfect fit.

The AGFI (adjusted goodness of fit index) takes into account degrees of freedom available for testing the model. While the AGFI is bounded above by one, which indicates a perfect fit, it is not bounded below by zero as is the GFI. The CFI (comparative fit index;

Bentler, 1990) is also truncated to fall between one and zero with values close to one indicating a very good fit.

Comparisons with competing models were made by testing the difference between the Chi-Square values of each model, as well as comparing ECVI values. The Chi-Square difference test was described by James, Mulaik, and Brett (1982) as a method for comparing a set of nested models. Comparisons continue from less restricted to more restricted models until the researcher finds a significant Chi-Square comparison. At this point comparisons stop and the restrictions on the involved parameters are rejected (Williams & James, 1994). The ECVI statistic estimates the degree to which a solution obtained from a sample at hand would generalize to the population (MacCallum, 1998), and lower values indicate a greater likelihood of generalization.

Examination of the solution (Hypotheses 1-8). In order to test each hypothesis, specific path loadings from the hypothesized model were examined for direction and significance. Hypothesis 1 stated that employee feelings of personal responsibility to participate in the BBS process would be directly related to involvement in the process. An examination of the path loading ($\beta = .24$) from personal responsibility to participation was not significant at the .05 level ($t = 1.86$, ns), and the hypothesis was not supported.

Hypothesis 2 stated that group cohesion would directly influence feelings of personal responsibility to participate in a BBS process. The path loading ($\beta = .13$) from group cohesion to feelings of personal responsibility to participate in the BBS process was not significant ($t = .56$, ns), and therefore this hypothesis was not supported.

Hypothesis 3 stated that trust in coworkers would directly influence feelings of personal responsibility to participate in the BBS process. The path loading ($\beta = -.15$) from

trust in coworkers to personal responsibility was not significant ($t = -.58$, ns), and the hypothesis was not supported.

Hypothesis 4 stated that trust in management would directly affect feelings of personal responsibility for participation in the BBS process. The path loading ($\beta = .45$) from trust in management to personal responsibility was significant at the .05 level ($t = 4.91$, $p < .05$). Thus Hypothesis 4 was supported.

Hypothesis 5 stated that an interdependent self-construal would have indirect effects on personal responsibility through its impact on group cohesion. Interdependent self-construal did demonstrate a significant path loading to group cohesion ($\beta = .42$; $t = 2.92$, $p < .05$). However, due to the insignificant loading from group cohesion to feelings of personal responsibility, Hypothesis 5 was only partially supported.

Hypothesis 6 stated that an interdependent self-construal would have an indirect influence on feelings of personal responsibility through its impact on trust in coworkers. Similar to Hypothesis 5, while the loading from interdependent self-construal to trust in coworkers was significant ($\beta = .55$; $t = 3.39$, $p < .05$), the loading from trust in coworkers to personal responsibility was not. As such, Hypothesis 6 was only partially supported.

Hypothesis 7 stated that perceptions of personal control would directly influence feelings of personal responsibility to participate in a BBS process. The loading ($\beta = .10$) from personal control to feelings of personal responsibility was not significant ($t = 1.14$, ns). Thus Hypothesis 7 was not supported.

Hypothesis 8 stated that personal control would indirectly influence feelings of personal responsibility through its impact on trust in management. An examination of the loading ($\beta = .28$) from personal control to trust in management revealed a value approaching,

but not quite reaching the .05 level of significance ($t = 1.86$, ns). Therefore, even though trust in management did significantly influence personal responsibility, Hypothesis 8 was not supported.

Figure 5 depicts the hypothesized structural model with its standardized path loadings. The supported hypotheses are denoted with an asterisk to the right of the path loading. As indicated in the table, three of the eight study hypotheses receive some support from the data collected.

Insert Figure 5 about here

Measures of overall fit. Table 3 displays the Chi-Square/degrees of freedom, RMSEA, GFI, AGFI, and CFI for the hypothesized, unconstrained, constrained, saturated, and independence latent variable models. An examination of the fit indices for the hypothesized model indicate the model appears to fit the data fairly well. Specifically, the RMSEA (.049) for the hypothesized model was below the .05 level recommended by Browne and Cudeck (1993). In addition, the GFI (.92) and CFI (.96) indices were both above the .90 criterion level. Only the AGFI (.88) statistic fell short of the .90 mark. Finally, the Chi-Square/df ratio was approaching 1 indicating the model provided an adequate fit to the data (Wolfe, 1999).

Insert Table 3 about here

Comparison of competing models. The fact that the hypothesized model appeared to provide an acceptable solution was a bit surprising given only three of the eight hypotheses were supported. Albeit, two of the insignificant pathways did approach significance. Using the

values displayed in Table 3, Chi-Square difference tests were used to compare the fit of the hypothesized model to the fit of the two alternative a priori models. The Chi-Square difference test comparing the hypothesized model to the unconstrained model was not significant ($\chi^2(5)=1.82, p>.05$), indicating support for the more restricted hypothesized model. In addition, the ECVI statistic for the hypothesized model (ECVI = 1.17) was smaller than the unconstrained model (ECVI = 1.21), suggesting the hypothesized model would be more likely to generalize to the population. Thus, both the Chi-Square difference test and the ECVI indicated the hypothesized model was preferable to the unconstrained model.

A second Chi-Square difference test compared the hypothesized model to the fit of the alternative constrained structural model. Again, the Chi-Square difference test was not significant ($\chi^2(1)=.85, p>.05$), indicating support for the simpler constrained model. In addition, the ECVI statistic for the constrained model (ECVI = 1.16) was smaller than the hypothesized model ECVI (1.17), suggesting the constrained model would more likely generalize to the population. Thus, both the Chi-Square difference test and the ECVI indicated the constrained model was preferable to the hypothesized model. The constrained model solution is displayed in Figure 6 along with standardized path loadings.

Insert Figure 6 about here

A post hoc model. Given the meager loadings obtained for the group cohesion/personal responsibility, and trust in coworker/personal responsibility paths, a post hoc model was examined in which these two paths were fixed to zero. The Chi-Square difference test between the constrained model and the post hoc model was not significant ($\chi^2(2)=3.12, p>.05$), indicating the additional constraints imposed by post-hoc model did not

significantly reduce the fit of the model to the data. More so, the ECVI remained the same, and the AGFI increased from .88 to .89. As such, the post-hoc model was accepted as the most appropriate model for the data collected in the current investigation. The accepted post hoc model is displayed in Figure 7 along with its corresponding fit indices.

Insert Figure 7 about here

Hypothesis 9. Hypothesis 9 stated that feelings of personal responsibility to participate in a BBS process would be a better predictor for each of the participation variables than conscientiousness. Table 4 reports descriptive statistics and zero-order correlations for the summed scale scores of the three personal responsibility items ($\alpha = .73$), the conscientiousness scale ($\alpha = .86$), and both participation variables. One of the two participation variables was the actual number of observations performed. The other participation variable included the two self-report involvement items which were combined to yield a single scale score ($\alpha = .86$)

Insert Table 4 about here

Four hierarchical regression equations were run to test Hypothesis 9. In the first two regression equations, the actual number of observations performed was used as the criterion variable. In the first regression equation, perceptions of personal responsibility were entered into the regression equation first, followed by conscientiousness. In the second regression equation conscientiousness was entered first, followed by feelings of personal responsibility.

Results from both hierarchical regression analyses are shown in Table 5. As indicated in the displayed results, feelings of personal responsibility were more predictive of behavioral observation performance than were self-reported levels of conscientiousness. In fact, regardless of when it was entered into the equation, conscientiousness did not account for any significant variance in the criterion variable. In contrast, feelings of personal responsibility was predictive of actual participation whether entered into the equation first ($r^2 = .06, p < .05$) or after controlling for conscientiousness ($\Delta r^2 = .05, p < .05$).

Insert Table 5 about here

In the second set of regression equations, the same procedure was followed with a different involvement criterion variable. As discussed above, the two self-report measures of involvement in the BBS process were summed and used as the measure of involvement. As indicated in Table 6 results were very similar to those found when using actual behavior as the criterion variable. When entered first in the regression equation, feelings of personal responsibility accounted for significant variance in self-reported involvement in the BBS process ($r^2 = .035, p < .05$). In contrast, regardless of when entered into the regression equation, conscientiousness did not account for significant variance in self-reported involvement in the BBS process.

Insert Table 6 about here

Hypotheses 10 and 11. Both Hypotheses 10 and 11 predicted changes in employee safety-related behaviors as a result of participation in a BBS process. Specifically, it was

hypothesized that individuals performing BBS observations would be more likely to demonstrate increases in safe behavior on the job (Hypothesis 10) and while driving (Hypothesis 11) than employees not performing BBS observations. Table 7 displays the descriptive statistics for each of the eight self-reported behaviors prior to and eight days after implementation of the BBS process. The displayed results reveal little variation in self-reports of safe behavior performance, on the job or while driving, from the first survey administration to the second.

Insert Table 7 about here

Table 8 contains the zero-order correlations for demographic variables as well as self-reported frequencies for performing eight different safety-related behaviors (four on the job, four while driving) both prior to, and eight days after the start of the new BBS process. Paired-sample t-tests were performed to determine if any changes in frequency of safe behavior performance had occurred. An investigation of the table demonstrates, not surprisingly, the largest correlations are found between a particular safety-related behavior as reported for Survey 1 and that same behavior as reported for Survey 2. Also of note in Table 8 is the trend toward larger correlations among safety related behaviors by context. For example, reported frequency for performance of a safety-related behavior while on the job tends to manifest a higher correlation with other on-the-job safety-related behaviors and a lower correlation with safety-related behaviors performed while driving.

Insert Table 8 about here

Table 9 displays the mean self-reported frequency for performing the eight different safety-related behaviors both for employees who performed safety observations as well as employees who did not perform any safety observations. Given the extreme difference in sample size between the participating employees ($n = 7$) and the non-participating employees ($n = 212$), no between-subject significance tests were performed. However, a visual inspection of Table 8 clearly indicates very little change in self-reported performance of safety-related behaviors (on or off the job), regardless of whether employees participated in the BBS process. Thus, Hypothesis 10 and 11 are not supported by the current investigation.

Insert Table 9 about here

Discussion

The primary objective of the current investigation was to increase our current understanding of variables that facilitate employee feelings of personal responsibility to participate in organizational processes. The context was implementation of a new BBS process in a bearings plant of 250 employees. After mandatory all-employee training, participation in the BBS process was completely voluntary.

The current investigation was also designed to explore whether personal responsibility for participation in organizational processes would be associated with actual participation. In other words, would employees who felt a greater responsibility to participate in the BBS process actually participate more than employees who did not feel such responsibility. An additional objective involved distinguishing between personal responsibility and conscientiousness with regard to predicting participation in the BBS process.

The current investigation was also designed to evaluate potential after effects of voluntary participation in a BBS process. More specifically, it was proposed that individuals who choose to become involved in the BBS process would demonstrate significant increases in their own safety behavior, whereas those who remained uninvolved would not change their safety-related behaviors.

Effects on Personal Responsibility

With respect to variables that influence feelings of personal responsibility it was proposed that both individual and organizational variables were potentially influential. The individual variables investigated were interdependent self-construal, group cohesion, and trust (in coworkers and management). Specifically, it was hypothesized that individuals with an interdependent self-construal would be more likely to develop cohesive and trusting relationships with their coworkers. To the extent that such high-quality relationships were developed, these individuals would also be more likely to feel a personal responsibility to engage in behaviors beneficial to their coworkers.

The data collected did not support this notion. Interdependent self-construal was significantly associated with both group cohesion and trust in coworkers. However, neither group cohesion nor trust in coworkers predicted employee feelings of personal responsibility to participate in the BBS process.

At first glance these results seemed surprising. A wealth of literature suggests both group cohesion and trust in coworkers should influence feelings of personal responsibility to participate in an organizational process, particularly one that is beneficial to everyone (Baumeister & Leary, 1995; Cartwright, 1968; Dose & Klimoski, 1995; Gully, Devine, & Whitney, 1995; Pierce & Gregersen, 1991). However, a second look at one of the

experimental assumptions, as well as some considerations of the participants' mindset provides some insight as to why the proposed relationships may not have been found.

Specifically, the author initially assumed the majority of employees would immediately see the benefits of the new BBS process to the health and well-being of themselves and their coworkers. Given the obvious benefits, interdependent employees who felt close to and trusted their coworkers would certainly feel some obligation to participate.

However, first-hand interactions with participants during the three-hour education/training sessions revealed that such assumptions were tenuous at best. In fact, a number of employees commented during training sessions that they could not see the relevance of the BBS process to the health and safety of themselves or their coworkers. In fact, some employees seemed to believe the new process was just as likely to cause an injury as it was to prevent it. While the employees who voiced these concerns were not in the majority, this cynicism or suspiciousness was loud and clear and perhaps influenced the perceptions or attitudes of many employees toward the BBS process. Given the results, it is probably safe to say that a number of employees shared the negative feelings toward BBS because neither group cohesion nor trust in coworkers was associated with elevated feelings of personal responsibility to participate in the BBS process.

Perhaps the simplest explanation can be found within the framework of Expectancy Theory (Locke, 1975). In particular the concept of instrumentality seems critical in this context. Vroom (1964) suggests instrumentality be considered a probability belief linking performance level to other outcomes, ranging from 1 (outcome achieved if performance level attained) to 0 (no relationship between performance and outcome) to -1 (a perfectly negative relationship between performance level and outcome).

Relating this idea to BBS, employees in the organization may have doubted the instrumentality of the process for achieving a safer working environment. To the extent employees could not see a relationship between participation and a safer working environment, the relationship between group cohesion and feelings of personal responsibility would also be attenuated.

It is also possible it was too early in the life span of the BBS process for the characteristics of employee relationships to manifest an impact. In other words, perhaps employees understood how such a process might benefit themselves and their coworkers but were simply not convinced the process would be sustained over the long term. Given the initial cynicism, it is likely eight days, the length of the intervention period before post-intervention measures were taken was simply not enough time for employees to realize the benefits of a BBS process.

A number of comments during training sessions indicated perceptions that processes such as these are just temporary – a new “flavor of the month”. Regardless of group cohesion and/or trust in coworkers why would one feel obligated to participate in a process that is going to be gone in a short period of time. If the BBS process were to survive in the organization for an extended period of time, it would be interesting to re-evaluate the role played by group cohesion and trust in coworkers on feelings of personal responsibility to participate.

Beyond interpersonal variables, it was also proposed that there were steps an organization could take to increase feelings of personal responsibility to participate in the BBS process. Specifically, it was hypothesized that by giving employees a greater sense of control over the process being introduced into the work environment, an organization could both

directly and indirectly (through trust in management) facilitate employee feelings of personal responsibility to participate in the BBS process.

Findings from this part of the investigation were mixed. Contrary to expectations, personal control did not have a significant direct influence on employee feelings of personal responsibility. It was also proposed that personal control would indirectly influence feelings of personal responsibility to participate in the BBS process through its influence on employee trust in management. This hypothesis was also not supported by the data.

The path loading from personal control to trust in management (.28) approached significance, and with a slightly larger sample size may have reached it. Given the literature supporting such a relationship (Deci, Connell, & Ryan, 1989) it seems unwise to conclude an absence of a relationship between these two variables.

Perhaps it was naïve to believe employees would increase their levels of trust in management as the result of one specific instance of increased personal control. Employee trust in management is likely developed and cultivated over many years of work experience and daily interactions between management and the hourly workers. Such perceptions are unlikely to be significantly changed by one specific process, particularly if the employees do not believe such increases in personal control will generalize to other processes, or even continue in the BBS process. And if they thought the BBS process would be short-lived, a personal control manipulation would be considered quite insignificant. It should also be noted that although the manipulation check was significant, the actual difference between average personal control scores found for participants in the two groups was not that large.

The hypothesized relationship between trust in management and subsequent employee feelings of personal responsibility to participate in the BBS process was supported. These

findings were very much in line with trust-related organizational research (Dose & Klimoski, 1995), as well as research performed specifically for the purpose of understanding BBS.

In particular, DePasquale & Geller (in press), found employee trust in management to be a predictor of self-reported participation in a BBS process. Specifically, it was trust in management ability (as opposed to intentions) that was most predictive of employee involvement in a BBS process. In other words, employees may understand how a BBS process can improve the safety culture in their organization, but if they are wary of management's ability to support the process or to keep participation anonymous, they will likely keep their participation to a minimum.

Trust in management intentions was also mentioned by participants in the DePasquale and Geller investigation as an important variable leading to employee participation in a BBS process. In other words, it was indicated by employees that if they feel management has ulterior motives for the implementation of a BBS process they would be less likely to get involved. The most commonly cited ulterior motive mentioned in their study was a desire by management to identify at-risk workers for disciplinary purposes.

It would appear, based on the results of the current investigation, that employee feelings of personal responsibility for participation in organizational processes is influenced to a greater extent by trust relationships between employees and management than between peers, at least in the initial or introductory phases of a process. This may be particularly true in those instances, as this one seemed to be, where employees are hard pressed to see any significant benefit for themselves or their coworkers due to their participation.

Effects on Participation

A second objective of this study was to determine if employee feelings of personal responsibility to participate would actually lead to greater levels of participation in the BBS process. Similar to personal control, the relationship between personal responsibility and participation approached but did not reach significance. Again, however, the path loading (.21) was of a magnitude suggestive of significance. While one can not conclude that feelings of personal responsibility influenced employee involvement in the process it seems presumptive at this point to eliminate it from consideration as an antecedent variable. In other words, the borderline findings with a low participation rate makes it unwise to accept the null hypothesis.

The impact of personal responsibility on participation in the BBS process may have been attenuated by other confounding variables in the organizational setting. For example, several employees stated during training sessions that there was no way they would let anyone observe them with a checklist while they were working. To the extent that this was a common attitude in the work environment, there may have been some employees who felt a personal responsibility to participate but did not want to risk disapproval from their fellow coworkers. Or again, it may simply have been a timing issue. Employees feeling some personal responsibility to participate in the process may have been waiting to see if the process was going to be supported and/or encouraged by management.

Personal Responsibility vs. Conscientiousness

Results obtained from the third aspect of the investigation lend credence to the notion that feelings of personal responsibility may influence participation in organizational processes. The aim of this aspect of the research was to assess the relative power of personal responsibility versus the conscientiousness trait for predicting the participation variables

measured in the current research. An examination of the regression results demonstrate feelings of personal responsibility and not conscientiousness were predictive of both actual frequency of behavioral observations performed, as well as self-reported levels of involvement in the BBS process.

It should be noted that these results might have been different had a different conscientiousness scale been used. In other words, in the current investigation a global conscientiousness scale was compared with a personal responsibility scale designed specifically for the study. Had the author modified the conscientiousness scale to fit the items to a work context it may have proven more powerful as a predictor of participatory behavior.

Induced Hypocrisy

The final objective of this research was to determine the impact, if any, of voluntary participation in the BBS process. It was proposed that individuals performing BBS observations would be susceptible to the induced hypocrisy effect (Aronson et al., 1991), and because of that would be the ones most likely to increase the frequency of their own safety-related behaviors. It was further proposed that these changes would take place both within and away from the work context.

Unfortunately, the number of individuals actually performing BBS observations was far lower than expected ($n = 7$). As such it was risky to perform any statistical analyses. Regardless, the results obtained did not appear to offer any support for the proposed hypothesis. Indeed, many of the mean frequencies reported for safe behavior performance remained almost identical to pre-BBS measures whether or not the employees had participated in the process or not.

Due to the small number of employees who actually performed observations in the beginning stages of the BBS process, it is recommended that a more longitudinal analysis be performed in order to capture the hypothesized phenomenon. As suggested earlier, a visit back to the experimental site six months to a year later might yield more compelling data, assuming the BBS process has survived. Eight days of participation in any process is likely too brief a time for a real-world manipulation of the hypocrisy effect.

Even with more longitudinal data, it may be difficult to find any changes for self-reports of safe work behavior. For items used in the current investigation, self reports of safe work behavior given at the first survey administration had little room for movement in the hypothesized direction. Perhaps employees were hesitant to report engaging in at-risk work behaviors while responding to a survey in the work environment, or perhaps the items simply were not sensitive enough to accurately reflect changes in frequencies of at-risk work behaviors. Finally, it may be the workers surveyed perceive that they rarely engage in at-risk work behavior. In fact, participation in a BBS process increases peoples awareness of their at-risk behaviors, and therefore some participants might become more sensitive to their at-risk work practices after BBS observation and feedback. Consider also that BBS attempts to open up conversation about near hits and at-risk behavior, so this increased awareness could bias a perception survey in the opposite way desired (or expected).

In sum, the current investigation represents an initial step in the attempt to understand the concept of personal responsibility and its consequences for organizational behavior. The mixed findings under less than optimal circumstances were promising and suggest a need for further research.

For example, it is presumed one of the reasons group cohesion and trust in coworkers did not influence personal responsibility to participate in the BBS process was because employees did not necessarily perceive the BBS process as particularly beneficial. Perhaps there are other organizational processes, or even specific work tasks or behaviors, that employees do feel are beneficial for their coworkers. If such a task or process could be identified, then the relationships proposed here might be demonstrated.

Also, research more longitudinal in nature is recommended. The current study investigated an organizational process in the very beginning stages of implementation. There were very likely a number of variables (e.g., lack of familiarity with the process, fear of negative consequences from cynical peers) that could have inhibited participation in the process regardless of individual feelings of personal responsibility to participate. It may be that feelings of personal responsibility become more predictive of behavior as the work culture becomes more accepting of the process. To understand how the life cycle of an organizational process is influenced by certain variables and vice versa, it is necessary to obtain behavioral, personality, and perception measurements periodically throughout the long-term implementation of a certain safety initiative.

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Table 1

Descriptive statistics for demographic and structural model variables (N = 219)

	Variable	<u>M</u>	SD	Alpha
1	Gender	-	-	-
2	Age	33.7	10.10	-
3	Mos	25.5	25.03	-
4	PC	-	-	-
5	Int1	3.70	.70	.72
6	Int2	3.90	.45	.61
7	Int3	3.21	.70	.56
8	GC1	4.08	.66	.89
9	GC2	3.48	.73	.89
10	GC3	3.84	.72	.89
11	TCA	3.74	.69	.64
12	TCI	3.99	.66	.80
13	TMA	3.46	.77	.77
14	TMI	3.44	.77	.70
15	PR1	3.86	.79	-
16	PR2	3.91	.78	-
17	PR3	3.76	.89	-
18	Obs	.39	2.17	-
19	SR1	3.70	.88	-
20	SR2	3.69	.96	-

Table 1 key. Gender = gender, Age = age, Mos = months with organization, PC = personal control, Int1 = interdependent beliefs, Int2 = interdependent norms, Int3 = interdependent values, GC1 = group cohesion 1, GC2 = group cohesion 2, GC3 = group cohesion 3, TCA = trust in coworker abilities, TCI = trust in coworker intentions, TMA = trust in management abilities, TMI = trust in management intentions, PR1 = personal responsibility 1, PR2 = personal responsibility 2, PR3 = personal responsibility 3, Obs = CBC observations, SR1 = self reported involvement item 1, SR2 = self reported involvement item 2

Table 2
Zero-order correlations for demographic and causal modeling variables

		1	2	3	4	5	6	7	8	9	10
1	Gnder	1.00									
2	Age	.06	1.00								
3	Mos	.06	.23**	1.00							
4	PC	-.01	-.02	.04	1.00						
5	Int1	-.10	.09	-.15*	-.07	1.00					
6	Int2	-.04	.05	-.06	.08	.25**	1.00				
7	Int3	-.10	-.13	-.21**	.21**	.25**	.14	1.00			
8	GC1	.06	.04	-.04	.20**	.06	.22**	.22**	1.00		
9	GC2	.05	-.03	-.04	.20**	-.04	.15	.22**	.70**	1.00	
10	GC3	.04	-.03	-.1	.19**	.03	.09	.26**	.68**	.75**	1.00
11	TCA	.00	-.01	-.15*	.19**	.11	.17**	.33**	.61**	.63**	.04
12	TCI	.04	.04	-.11	.19**	.11	.23**	.21**	.62**	.63**	.68**
13	TMA	-.06	.05	-.21**	.28**	.29**	.27**	.29**	.32**	.28**	.28**
14	TMI	-.10	-.00	-.17**	.26**	.26**	.22**	.30**	.30**	.32**	.26**
15	PR1	-.04	.04	-.01	.31**	.07	.25**	.23**	.24**	.19**	.17**
16	PR2	.01	.01	-.01	.31**	-.04	.22**	.20**	.24**	.17**	.12
17	PR3	-.02	.03	-.12	.25**	.20**	.25**	.34**	.17**	.06	.08
18	Obs	.07	-.02	-.03	.12	-.07	.12	.12	.10	.12	.06
19	SR1	-.05	.12	.04	.22**	-.01	-.11	.01	.02	.00	-.02
20	SR2	-.06	.03	.08	.21**	-.07	-.09	.05	.02	.00	.04
		11	12	13	14	15	16	17	18	19	
11	TCA	1.00									
12	TCI	.71**	1.00								
13	TMA	.34**	.34**	1.00							
14	TMI	.31**	.30**	.74**	1.00						
15	PR1	.16*	.20**	.33**	.32**	1.00					
16	PR2	.19**	.20**	.30**	.31**	.63**	1.00				
17	PR3	.12	.15*	.31**	.30**	.45**	.39**	1.00			
18	Obs	.14*	.16**	.09	.17**	.23**	.21**	.18**	1.00		
19	SR1	.04	.02	.09	.10	.17**	.09	.17**	.17**	1.00	
20	SR2	.01	.02	.03	.06	.16*	.10	.14*	.15*	.76**	1.00

* correlation significant $p < .05$, ** correlation significant $p < .01$

Table 2 key. Gender = gender, Age = age, Mos = months with organization, PC = personal control, Int1 = interdependent beliefs, Int2 = interdependent norms, Int3 = interdependent values, GC1 = group cohesion 1, GC2 = group cohesion 2, GC3 = group cohesion 3, TCA = trust in coworker abilities, TCI = trust in coworker intentions, TMA = trust in management abilities, TMI = trust in management intentions, PR1 = personal responsibility 1, PR2 = personal responsibility 2, PR3 = personal responsibility 3, Obs = CBC observations, SR1 = self reported involvement item 1, SR2 = self reported involvement item 2

Table 3

Fit indices for a priori models

Model	Chi Square	df	RMSEA	GFI	AGFI	CFI	ECVI
Saturated	-	-	-	-	-	-	1.40
Unconstrained	163.05	103	.052	.92	.88	.96	1.21
Hypothesized	164.87	108	.049	.92	.88	.96	1.17
Constrained	165.72	109	.049	.92	.88	.96	1.16
Independence	-	-	-	-	-	-	7.27

Table 4

Zero-order correlations for personal responsibility, conscientiousness, behavior observations and self-reported involvement

	<u>M</u>	<u>SD</u>	<u>PR</u>	<u>Cons</u>	<u>Obs</u>	<u>InvSR</u>
PR	11.64	1.98	.73			
Cons	7.33	.81	.33**	.86		
Obs	.39	2.17	.25**	.09	-	
InvSR	7.32	1.86	.15*	.06	.17*	.86

* $p < .05$; ** $p < .01$

Scale reliability levels are located on the matrix diagonal.

PR = personal responsibility, Cons = Conscientiousness, Obs = CBC observations, InvSR = self reported involvement

Table 5

Predicting actual performance of observations**Regression equation with *conscientiousness* entered first:**

Variables Entered on Step 1	R Square	Beta	Signif of t
Conscientiousness	.02	.15	.05
Variables Entered on Step 2	R Square	Beta	Signif of t
Conscientiousness	-	.08	.31
Personal Responsibility	.07	.22	.01

Regression equation with *personal responsibility* entered first:

Variables Entered on Step 1	R Square	Beta	Signif of t
Personal Responsibility	.06	.25	.00
Variables Entered on Step 2	R Square	Beta	Signif of t
Personal Responsibility	-	.22	.01
Conscientiousness	.06	.08	.31

Table 6

Predicting self-reported involvement in the BBS process

Regression equation with *conscientiousness* entered first:

Variables Entered on Step 1	R Square	Beta	Signif of t
Conscientiousness	.00	.05	.55

Variables Entered on Step 2	R Square	Beta	Signif of t
Conscientiousness	-	-.00	.96
Personal Responsibility	.02	.16	.06

Regression equation with *personal responsibility* entered first:

Variables Entered on Step 1	R Square	Beta	Signif of t
Personal Responsibility	.02	.15	.05

Variables Entered on Step 2	R Square	Beta	Signif of t
Personal Responsibility	-	.16	.06
Conscientiousness	.02	-.00	.96

Table 7

Descriptive statistics for safe behavior performance prior to and after implementation of the BBS process

First survey administration results:			
	Item	M	SD
1.	When doing my job I make a conscious effort to follow all safety procedures.	4.14	.56
2.	In the last week, how many time have you performed your job using all the required PPE	4.74	.45
3.	In the last week, how often have you take a shortcut that could be considered at-risk while doing your job?	1.77	.72
4.	In the last week, how often have you performed any work behaviors that could be classified as at-risk?	1.83	.73
5.	In the last week, how often have you used your safety-belt while traveling in a car?	3.76	1.53
6.	In the last week, how often did you come to a complete stop while driving?	4.04	.77
7.	In the last week, how often have you used your turn signal when making a turn or changing lanes?	4.27	.74
8.	In the last week, how often have you found yourself driving your car a little too closely to the car in front of you?	2.38	.99

Second survey administration results:			
	Item	M	SD
1.	When doing my job I make a conscious effort to follow all safety procedures.	4.38	.60
2.	In the last week, how many time have you performed your job using all the required PPE	4.77	.47
3.	In the last week, how often have you take a shortcut that could be considered at-risk while doing your job?	1.72	.82
4.	In the last week, how often have you performed any work behaviors that could be classified as at-risk?	1.73	.79
5.	In the last week, how often have you used your safety-belt while traveling in a car?	3.93	1.36
6.	In the last week, how often did you come to a complete stop while driving?	4.06	.78
7.	In the last week, how often have you used your turn signal when making a turn or changing lanes?	4.23	.74
8.	In the last week, how often have you found yourself driving your car a little too closely to the car in front of you?	2.23	.93

Table 8

Zero order correlations for self-reported safe behavior frequencies before and after BBS

process implementation

		1	2	3	4	5	6	7	8
1	procs1	1.00							
2	ppe1	.13	1.00						

3	short1	-.29**	-.19**	1.00					
4	a-r1	-.18**	-.20**	.47**	1.00				
5	sb1	.21**	.15*	-.13	-.09	1.00			
6	stop1	.16*	.17**	-.34**	-.17**	.29**	1.00		
7	trn sig1	.16*	.12	-.24**	-.14*	.17**	.33**	1.00	
8	drive c1	-.17**	-.04	.23**	.13	-.17**	-.32**	-.18**	1.00
9	procs2	.51**	.13	-.18**	-.13	.17**	.12	.08	-.13
10	ppe2	.18**	.52**	-.12	-.12	.16*	.15*	.03	-.11
11	short2	-.18**	-.13	.44**	.27**	-.02	-.19**	-.09	.17**
12	a-r2	-.18**	-.01	.23**	.50**	-.09	-.16*	-.18**	.14*
13	sb2	.09	.20**	-.12	-.09	.79**	.23**	.22**	-.20**
14	stop2	.17**	.06	-.30**	-.08	.18**	.66**	.28**	-.19**
15	trn sig2	.19**	.04	-.17**	-.06	.27**	.32**	.67**	-.20**
16	drive c2	-.12	-.02	.18**	.09	-.15*	-.26**	-.13	.60

		9	10	11	12	13	14	15	16
9	procs2	1.00							
10	ppe2	.35**	1.00						
11	short2	-.29**	-.17**	1.00					
12	a-r2	-.28**	-.22**	.49**	1.00				
13	sb2	.13	.14*	-.04	-.10	1.00			
14	stop2	.23**	.09	-.14*	-.14*	.25**	1.00		
15	trn sig2	.12	.07	-.01	-.13	.25**	.43**	1.00	
16	drive c2	-.12	-.02	.15*	.12	-.16*	-.22**	-.26**	1.00

* = correlation significant at $p < .05$; ** = correlation significant at $p < .01$

procs = following safe work procedures, ppe = using required ppe, short = taking shortcuts, a-r = doing anything at-risk, sb = using safety belt, stop = complete stops at stop signs, trn sig = use of turn signal, drive c = driving to close

variables followed by a 1 denote results from the first survey, variables followed by a 2 denote results from the second survey

Table 9

Paired comparison t-tests for frequency of safe behavior performance**Employees performing observations (n = 7)**

	Item	S1 <u>M</u>	S2 <u>M</u>
1.	When doing my job I make a conscious effort to follow all safety procedures.	4.43	4.57
2.	In the last week, how many time have you performed your job using all the required PPE	4.86	4.86
3.	In the last week, how often have you take a shortcut that could be considered at-risk while doing your job?	1.50	1.57
4.	In the last week, how often have you performed any work behaviors that could be classified as at-risk?	1.71	1.43
5.	In the last week, how often have you used your safety-belt while traveling in a car?	3.71	4.00
6.	In the last week, how often did you come to a complete stop while driving?	3.86	3.71
7.	In the last week, how often have you used your turn signal when making a turn or changing lanes?	4.29	3.86
8.	In the last week, how often have you found yourself driving your car a little too closely to the car in front of you?	2.14	2.29

Employees not performing observations (n = 212)

	Item	S1 <u>M</u>	S2 <u>M</u>
1.	* When doing my job I make a conscious effort to follow all safety procedures.	4.13	4.37*
2.	In the last week, how many time have you performed your job using all the required PPE	4.73	4.76
3.	In the last week, how often have you take a shortcut that could be considered at-risk while doing your job?	1.77	1.72
4.	In the last week, how often have you performed any work behaviors that could be classified as at-risk?	1.83	1.74
5.	* In the last week, how often have you used your safety-belt while traveling in a car?	3.76	3.92*
6.	In the last week, how often did you come to a complete stop while driving?	4.05	4.07
7.	In the last week, how often have you used your turn signal when making a turn or changing lanes?	4.27	4.24
8.	* In the last week, how often have you found yourself driving your car a little too closely to the car in front of you?	2.39	2.23*

* = significant at $p < .05$; S1 = survey at time 1, S2 = survey at time 2

List of Figures1.Hypothesized structural model2.Unconstrained model

3. Constrained model

4. Critical behavior checklist

5. Hypothesized model with standardized path loadings

6. Constrained model with standardized path loadings

7. Accepted post-hoc model with standardized path loadings and fit indices

* indicates a significant path loading

Figure 1

Hypothesized structural model

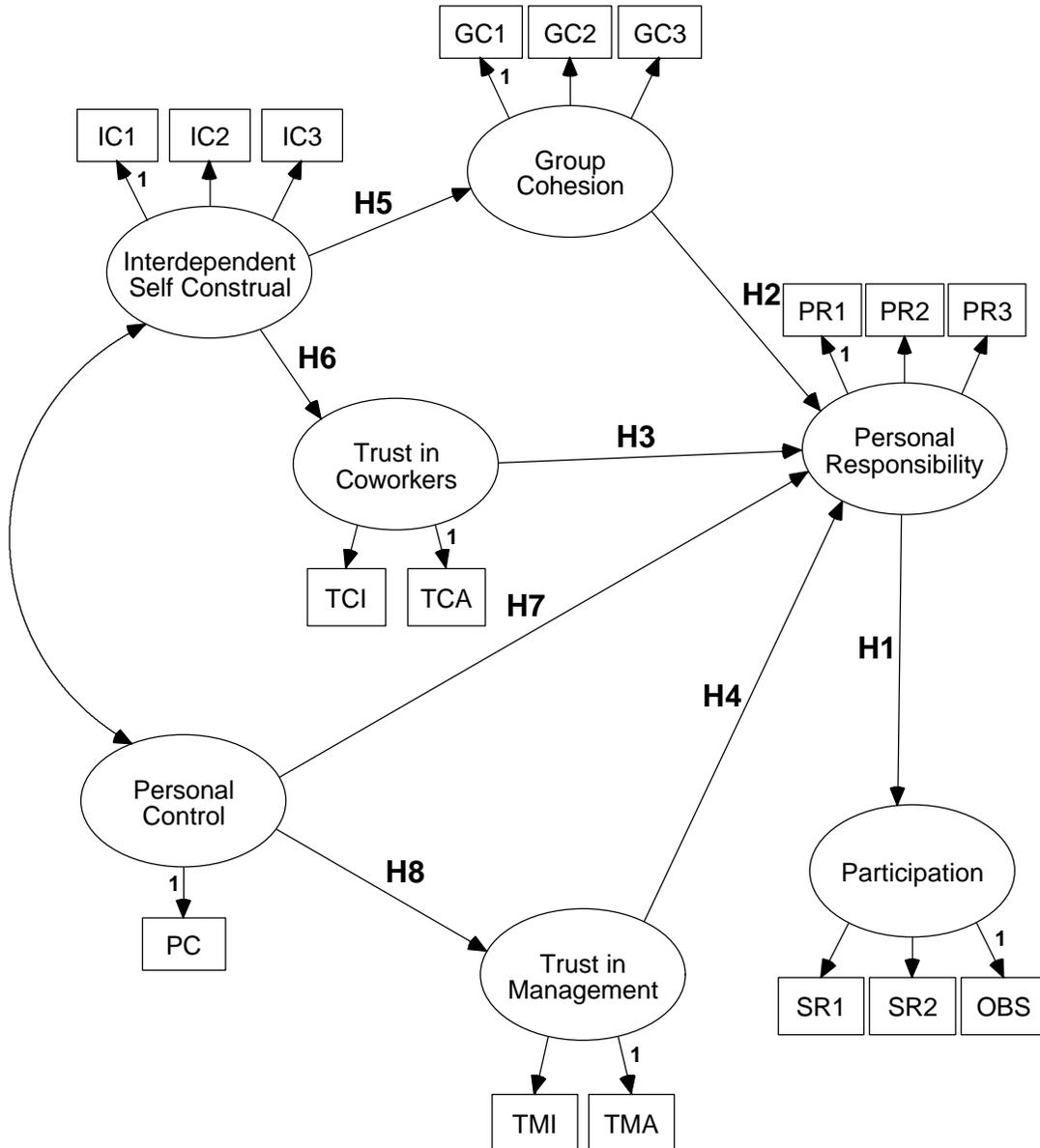


Figure 2

Unconstrained structural model

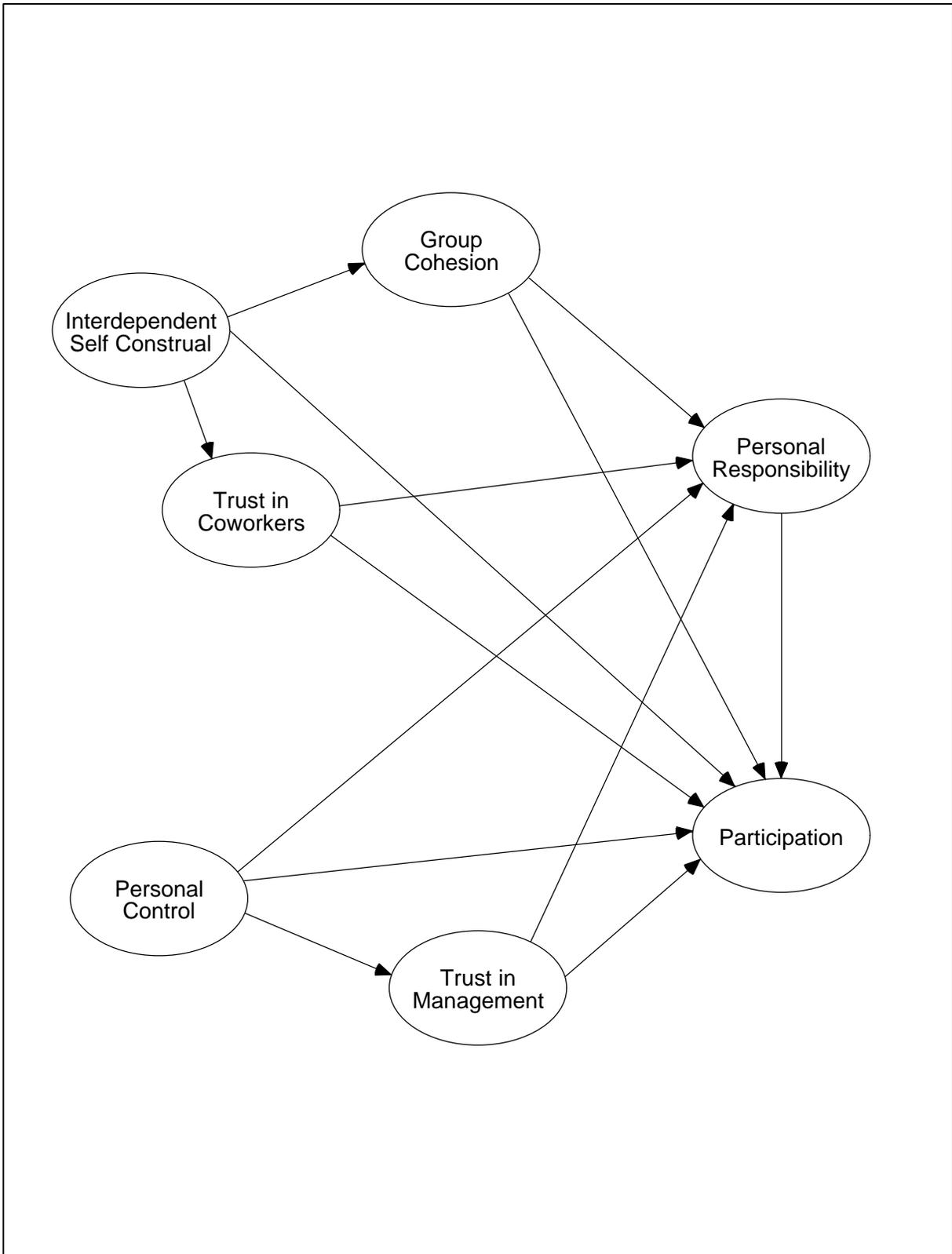


Figure 3

Constrained structural model

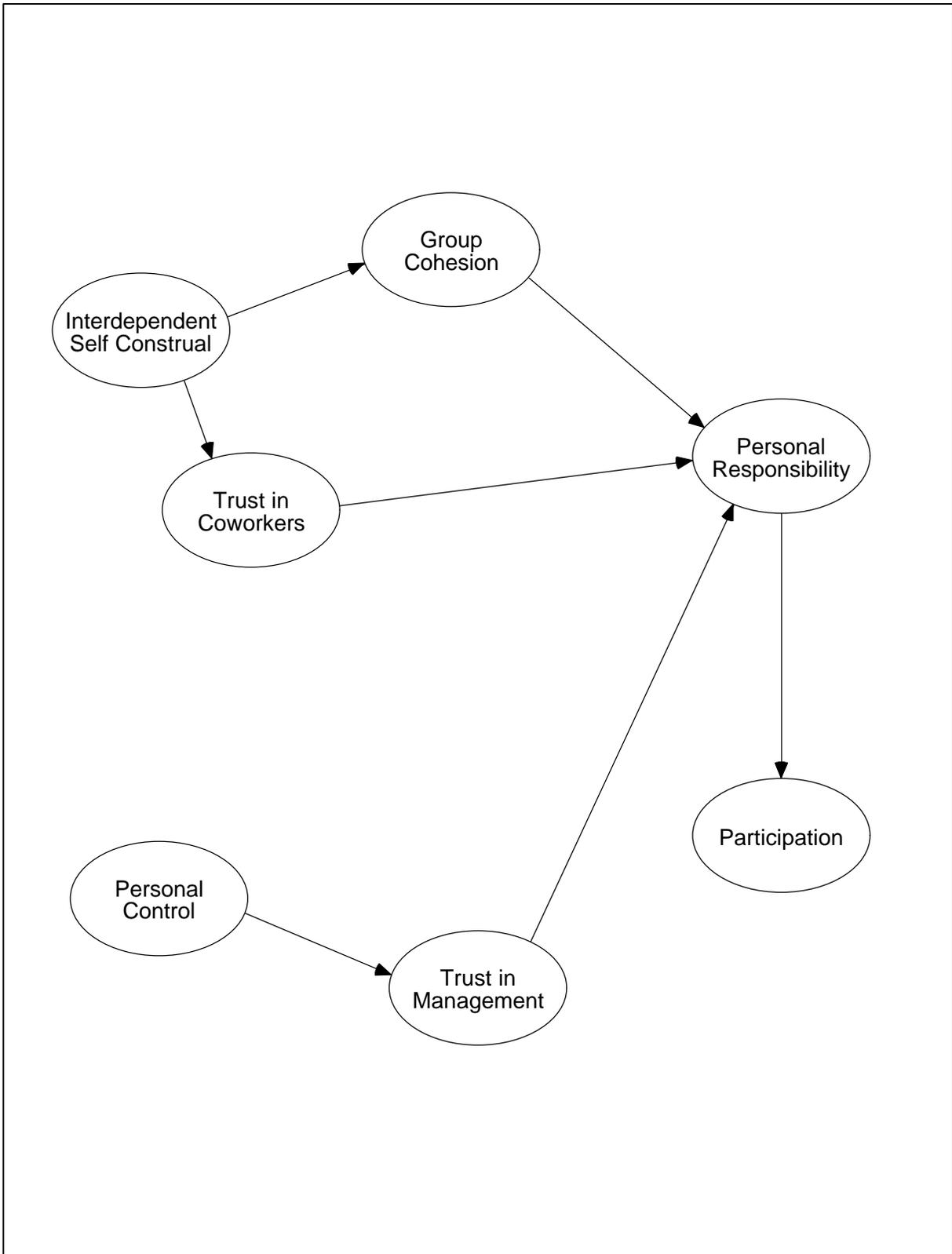


Figure 4

The critical behavior checklist

Clock #: _____				TIMKEN CBC		Date: _____	
Department: HT DR GD ASSY Labs Other:							
Behavioral Category		Safe	At-Risk	Comments			
Housekeeping							
Clear aisles/walkways							
Floor clean							
Work are organized							
Other:							
PPE							
Safety glasses							
Safety Shoes							
Jewelry							
Hair anchored							
Other:							
General							
Body positioning							
Material handling							
Pinch points							
Other:							

Figure 5

Hypothesized structural model with path loadings

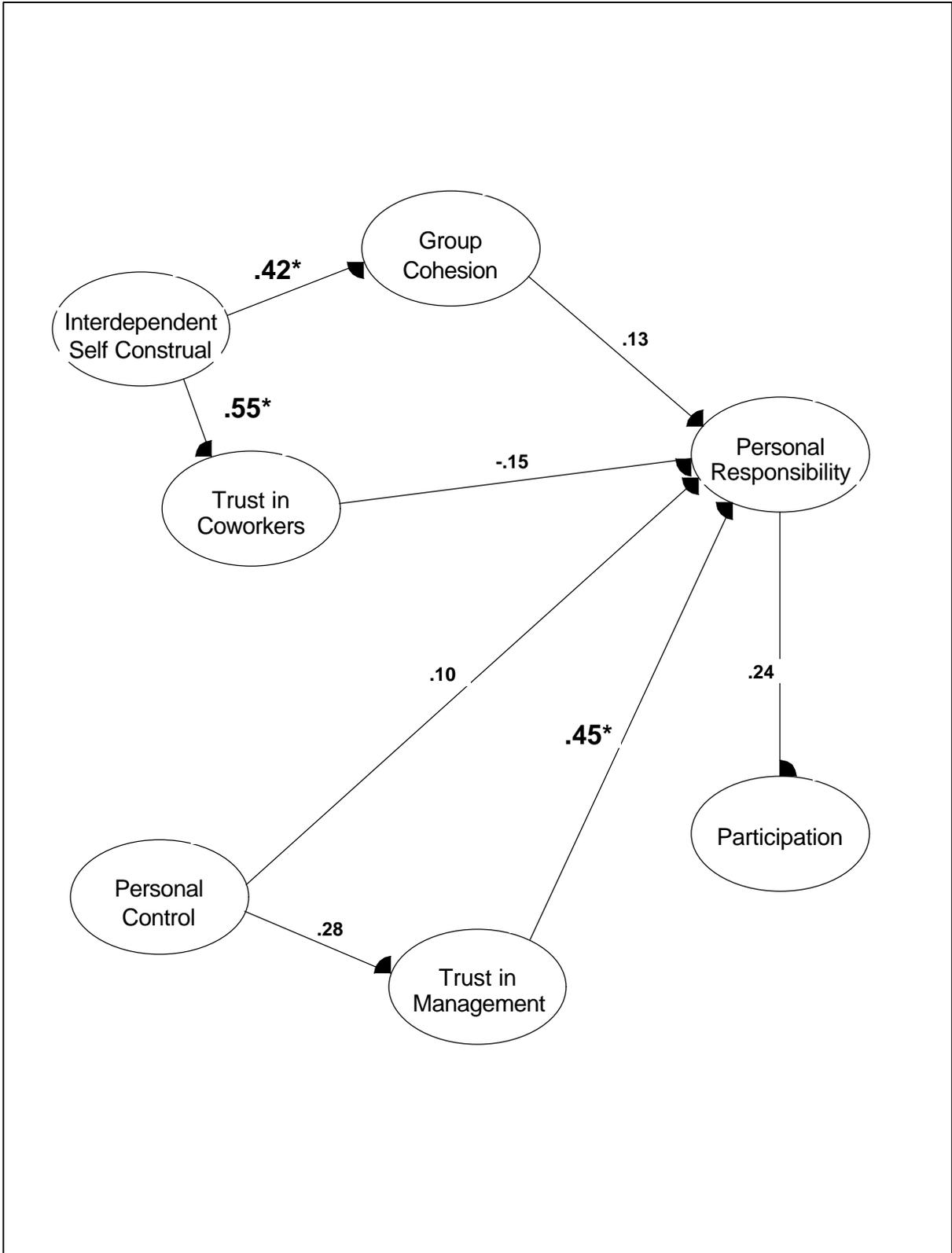


Figure 6

Constrained structural model with path loadings

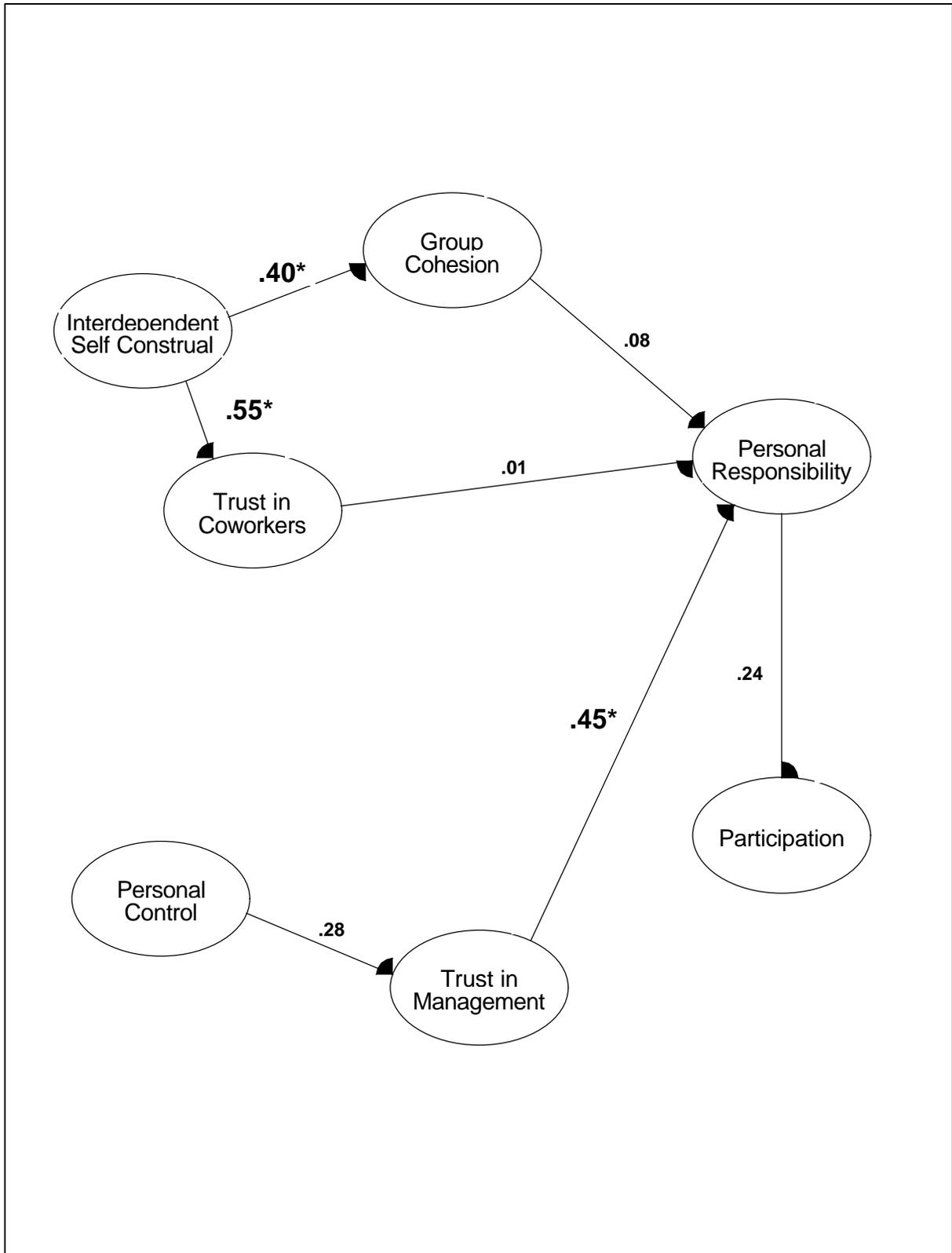
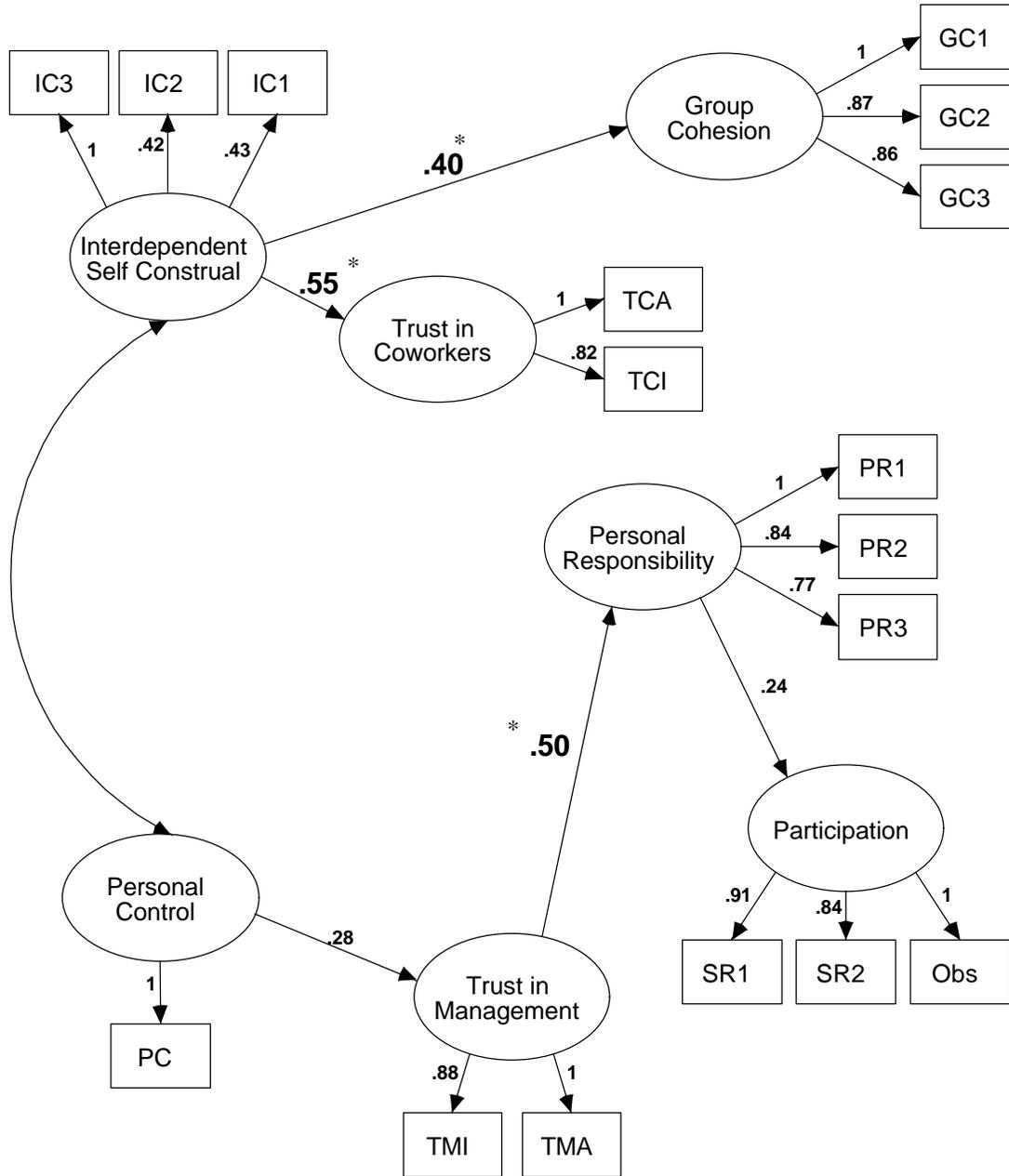


Figure 7

Post hoc structural model with path loadings



Chi-square = 168.84, df = 111, RMSEA = .049, GFI = .92, AGFI = .89, CFI = .96, ECVI = 1.16

Appendix A:

Survey items:

1. Personal Control Manipulation
2. Personal Control Manipulation Check
3. Interdependent Self-Construal
4. Group Cohesion
5. Trust
6. Personal Responsibility
7. Involvement in the BBS process
8. Conscientiousness
9. Safe Work and Driving Behaviors

Personal Control Manipulation

1. How many observations do you recommend be made per employee, per week?
2. Would it be acceptable to you to have employees do observations for their jobs other than their own?
3. Are there any specific suggestions you can make that you feel would improve the safety process?
4. Do you feel it is acceptable for management level employees to do observations with the checklist?
5. Is there anything you think should be added to, or removed from the observation checklist?

Personal Control Manipulation Check

1. I feel I have had an opportunity to influence decisions regarding the specifics of our behavior-based safety process.
2. I do not feel I have had the opportunity to give input regarding how the behavior-based safety process is going to look. ®
3. Several aspects o the behavior-based safety process are in part, a result of my input.

Interdependent Self-Construal Wagner & Moch (1986)

Beliefs

1. My work group is more productive when its members do what they want to do rather than what the group wants them to do. ®
2. My work group is more efficient when its members do what they think is best rather than what the group wants them to do. ®
3. My work group is more productive when its members follow their own interests and concerns. ®

Values

1. I prefer to work with others rather than work alone.
2. Given the choice, I would rather do a job where I can work alone rather than a job where I have to work with others. ®
3. I like it when members of my work group do things on their own, rather than working with others all the time. ®

Norms

1. People in my work group should be willing to make sacrifices for the sake of the work group (such as working late now and then, going out of their way to help, etc.).
2. People in my work group should realize that they sometimes are going to have to make sacrifices for the sake of the work group as a whole.
3. People in my work group should recognize they are not always going to get what they want.
4. People should be made aware that if they are going to be a part of a work group, they are sometimes going to have to do things the way they don't want to.
5. People in my work group should do their best to cooperate with each other instead of trying to work things out on their own.

Group Cohesion

(Wheeles, Wheeles, & Dickson-Markman, 1982)

1. I really enjoy being with my coworkers.
2. My coworkers share a lot in common.
3. I feel like I belong to my work group.
4. I feel very close to my coworkers.
5. I trust my coworkers.
6. I understand my coworkers.
7. My coworkers are not very close at all. ®
8. I dislike my coworkers.
9. My work group members feel very close to each other.

Trust
Cook & Wall (1980)

Management Abilities

1. Our firm has a poor future unless it can attract better managers. ®
2. Management can be trusted to make sensible decisions for the future of the organization.
3. Management at work seems to do an efficient job.

Management Intentions

1. Management in my firm is sincere in its attempts to meet the workers' point of view.
2. I feel quite confident that this organization will always treat me fairly.
3. Our management would be quite prepared to gain advantage by deceiving the workers. ®

Coworker Abilities

1. I have full confidence in the skills of my work mates.
2. Most of my fellow workers would get on with their work even if supervisors were not around.
3. I can rely on other workers not to make my job more difficult by careless work.

Coworker Intentions

1. If I got into difficulties at work I know my work mates would try and help me out.
2. I can trust the people I work with to lend me a hand if I need it.
3. Most of my work mates can be relied upon to do as they say they will.

Personal Responsibility

1. Even though it is not part of my job, I feel it is part of my personal responsibility to participate in the behavior-based safety process.
2. The only way to get me to participate in the behavior-based safety process is to make it mandatory. ®
3. Even though I do not have to, I feel an obligation to participate in the behavior-based safety process.

Involvement in the BBS process

1. How involved would you say you have been in the behavior-based safety process?
2. Compared with your coworkers, how involved have you been in the behavior-based safety process?

Conscientiousness

Goldberg (1992)

Please use this list to describe yourself as accurately as possible. Describe yourself as you see **yourself at the present time, not as you wish to be in the future**. Describe yourself as you are generally or typically, as compared with other persons you know of your sex and age. After each word, please write a number indicating how accurately that trait describes you. After each word, please write a number indicating how accurately that trait describes you. Please use the following rating scale.

- 1 = Extremely Inaccurate
- 2 = Very Inaccurate
- 3 = Quite Inaccurate
- 4 = Slightly Inaccurate
- 5 = Neutral
- 6 = Slightly Accurate
- 7 = Quite Accurate
- 8 = Very Accurate
- 9 = Extremely Accurate

Organized:

Systematic:

Thorough:

Practical:

Neat:

Efficient:

Careful:

Steady:

Conscientious:

Prompt:

Safe Work and Driving Behaviors

Safe Work Behaviors

1. When doing my job I make a conscious effort to follow all safety procedures.
2. In the last week, how many times have you performed your job using all the required PPE
3. In the last week, how often have you taken a shortcut that could be considered at-risk while doing your job?
4. In the last week, how often have you performed any work behaviors that could be classified as at-risk?

Safe Driving Behaviors

1. In the last week, how often have you used your safety-belt while traveling in a car?
2. In the last week, how often did you come to a complete stop while driving?
3. In the last week, how often have you used your turn signal when making a turn or changing lanes?
4. In the last week, how often have you found yourself driving your car a little too closely to the car in front of you?

Appendix B:

Professional Vita

Jason P. DePasquale

2410 Ridge Road
Blacksburg, VA 24060

(540) 951-4929

Jasond@isrsurveys.com

EDUCATION

Ithaca College, Ithaca, NY

Major: Psychology – Minor: Philosophy
Attended 9/87 to 12/89

State University of New York at Albany, Albany, NY

B.A., Psychology – Minor: Philosophy
December 1991, Overall GPA: 3.3/4.0

Rensselaer Polytechnic Institute & State University, Troy, NY

M.S., Industrial/Organizational Psychology
May 1994, Overall GPA: 3.8/4.0

Thesis: The Impact of Screening Method and Perceived Need on Perceived Fairness and Invasion of Privacy.

Virginia Polytechnic Institute and State University, Blacksburg, VA

Ph.D. Candidate, Industrial/Organizational Psychology
August 1994 – present, Overall GPA: 3.8/4.0

Dissertation: Exploring Personal Responsibility for Participation in Organizational Processes: Antecedents and Consequences.

PROFESSIONAL AFFILIATIONS AND ORGANIZATIONS

American Psychological Association
Academy of Management
Society for Industrial and Organizational Psychology

COMPUTER SKILLS

Knowledge of IBM PC and Macintosh PC Systems. Experience with SPSS, SAS, AMOS, Statview, Microsoft Word, WordPerfect, Lotus 1-2-3, Excel, Superpaint.

EXPERTISE

Jason's primary areas of expertise include the design, implementation, and analysis of behavior-based intervention processes in the workplace. In addition, Jason has experience in the development and validation of survey tools used to assess individual and cultural variables in community and industrial settings. His major research interests are in the fields of Organizational Development, Organizational Psychology, and Organizational Behavior Management.

PROFESSIONAL HISTORY

Currently, Jason works as a Research Associate with the Center for Applied Behavior Systems. He is involved in most aspects of this center, including management of research projects, recruiting center personnel, leading weekly research meetings, and developing and implementing educational programs for center research assistants. As a research associate, Jason has played a key role in acquiring, and performing research on two grants from the National Institute for Occupational Safety & Health.

Additionally, for the last two years Jason has served as a consultant with Safety Performance Solutions. His responsibilities include facilitating professional workshops on behavior-based safety as well as conducting training seminars for numerous organizations. Some of the organizations he has worked with include BHP Copper, Hoechst Celanese, Exxon, Hercules, Lucent Technologies, Pool California Energy Services, Federal Mogul, and Coca-Cola.

PROFESSIONAL CONTRIBUTIONS

Jason has conducted numerous research projects in industrial settings, including the application of the behavior-based interventions to increase employee performance of safe working behaviors. His fieldwork also includes the development and validation of survey tools to assess organizational culture. In addition, he has co-authored one book chapter, five publications, four published abstracts and over 25 professional conference presentations.

RESEARCH AND TEACHING EXPERIENCE

9/98 to present - Research Assistant on a two year grant from the National Institute for Occupational Safety and Health (grant # 1 R01 CCR315316-01) for the purposes of designing and implementing behavior-based safety strategies to be used to increase safety in mining operations.

6/96 to 8/98 - Research Assistant on a two-year grant from the National Institute for Occupational Safety & Health (grant # 1 R01 OH03397-01) looking at techniques to improve safe driving practices of pizza delivery employees.

2/96 to 8/98 - Project Coordinator on a two-year grant from the National Institute for Occupational Safety & Health (grant # 1 R01 OH03374-01) investigating the critical success factors for behavior-based safety in applied industrial settings.

8/96 to 12/96 - Graduate Teaching Assistant for Introductory Psychology Lab, Virginia Tech, Fall 1997. Opportunities included preparing lectures, designing in class assignments, grading assignments, and assigning grades for two sections of classes.

8/94 to 1/96 - Research Assistant on a two-year grant from the National Institute on Alcohol Abuse and Alcoholism (grant # 5 R01 AA09604-02) investigating college-aged drinkers' propensity to engage in behaviors which minimize the risk of driving while intoxicated.

WORK EXPERIENCE

8/96 to Present - *Associate*, Safety Performance Solutions, Blacksburg, VA. Responsibilities include assisting in training material development, leading professional workshops and seminars, and facilitating safety training workshops and coaching employees in the implementation of behavioral safety programs for use in industrial settings. To date Jason has over 600 hours of professional training experience.

7/94 to present - *Research Associate*, The Center for Applied Behavior Systems. Position responsibilities include managing, developing, organizing, and analyzing series of research projects investigating the behavioral and environmental influences of various socially valid topics of current interest in industry, community, and college settings.

BOOKS AND BOOK CHAPTERS

DePasquale, J. P., Boyce, T. E., Pettinger, C. B. & Williams, J. H. (1998). A process blueprint: Timeline and phases of implementation. In E. S. Geller, *Practical Behavior-Based Safety: Step by Step methods to improve your workplace* (2nd ed.). Neenah, WI: J. J. Keller & Associates Inc.

Geller, E. S., Carter, N., **DePasquale, J. P.**, Pettinger, C. B., & Williams, J. H. (1999). Applications of behavioral science to improve mine safety. To appear in Karmis, M (Ed.), *Concepts and processes in mine health and Safety Management*, Society for Mining, Metallurgy, and Exploration, Inc.

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Clarke, S. W., Geller, E. S., & **DePasquale, J. P.**, (1999). A Behavioral Analysis of Safety-Related Bicycling Practices of University Students. *Journal of American College Health*, under review.

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- DePasquale, J. P.**, Williams, J. H., Pettinger, C. B., Jr., Ford, D. K., & Glindemann, K. E. (1998, May). *In search of safety excellence: A comparative analysis of current behavior-based safety efforts*. Paper presented at the 24th Annual Convention of the Association of Behavior Analysis, Orlando, Florida.
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