

8-21-2014

# Organizational Health Climate: Three Facets and Outcomes of Relevance to Organizations

Zandra M. Zweber

*University of Connecticut, Zandra.Zweber@uconn.edu*

Follow this and additional works at: <https://opencommons.uconn.edu/dissertations>

---

## Recommended Citation

Zweber, Zandra M., "Organizational Health Climate: Three Facets and Outcomes of Relevance to Organizations" (2014). *Doctoral Dissertations*. 541.

<https://opencommons.uconn.edu/dissertations/541>

# Organizational Health Climate: Three Facets and Outcomes of Relevance to Organizations

Zandra M. Zweber, Ph.D.

University of Connecticut, 2014

The concept of healthy organizations has been explored theoretically in the research literature yet until recently a lack of sound and practical psychometric work in the area has prevented fundamental research as to what are the benefits of making an organization healthier. Viewing organizational health climate as one component of a healthy organization, the overarching goal of the current study was to argue for, and find evidence of, the importance of having a healthy workplace climate. Three complementary studies examined multiple questions about the importance and impact of organizational health climate. First, Study 1 examines the outcomes of physical health and mental health as they relate to the three facets of organizational health climate assessed via the Multifaceted Organizational Health Climate Assessment survey tool (MOHCA; Zweber, Henning, & Magley, under review). The underlying mechanisms through which these facets affect employee health are also examined, as well as whether all three of these facets are necessary in combination to experience benefits of a healthy workplace climate. Study 2 then examines health climate at the group-level, rather than an individual-level, as it relates to other workplace outcomes. Lastly, Study 3 extends the scope of the investigation by examining the broader level of objective job context as it relates to organizational health climate and outcomes. Results from these three studies indicate some indirect effects of health climate facets on employee health as well as significant relationships with the facets and employee engagement, performance and organizational

citizenship behaviors. Results also suggest the importance of strength in all three facets in order for organizations to maximally experience the benefits of a healthy workplace climate. Lastly, results from Study 3 indicate that, for the most part, the type of organization, or job type does not directly influence perceptions of health climate. Combined, the results from these three studies have important implications for organizations in terms of developing interventions to potentially benefit employee health and health climate perceptions.

Organizational Health Climate: Three Facets and Outcomes of Relevance to  
Organizations

Zandra M. Zweber

B.A., American University, 2010

M.A., University of Connecticut, 2012

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

at the

University of Connecticut

2014

Copyright by  
Zandra M. Zweber

2014

APPROVAL PAGE

Doctor of Philosophy Dissertation

Organizational Health Climate: Three Facets and Outcomes of Relevance to  
Organizations

Presented by

Zandra M. Zweber, B.A., M.A.

Major Advisor

---

Robert A. Henning

Associate Advisor

---

Vicki J. Magley

Associate Advisor

---

Pouran Faghri

University of Connecticut

2014

## **ACKNOWLEDGEMENTS**

I would like to extend my sincere appreciation to my advisor, Robert Henning. Without his assistance, encouragement and support I would not have been able to complete my dissertation and graduate training. I would also like to thank my committee members and examiners, Vicki Magley, Pouran Faghri, Devl Dalal, Steven Mellor and Janet Barnes-Farrell who have had a great influence on myself and my research throughout my graduate training.

In addition, this project would not have been possible without the support and experiences I have had from the Center for the Promotion of Health in the New England Workplace (CPH-NEW). I genuinely appreciate the input that I have had from this multidisciplinary research team as it has deepened my interest in the field of Occupational Health Psychology.

I would also like to thank my fellow graduate students who have supported myself and this research project in various ways. Their presence and support has allowed me to achieve my goals in graduate school as well as moving forward. I would like to specifically thank Jenna Shapiro, Andrea Bizarro, Tim Bauerle, Lindsey Graham and Benjamin Walsh who all played major roles in the collection of the various data sources that were used for this project.

Finally, I want to thank my family for their continued support not only through graduate school but through all my years of education. The values they have instilled in me as well as their encouragement has allowed me to reach my highest academic goals.

## TABLE OF CONTENTS

Study 1 Introduction .....	1
Social-Ecological Systems Perspective .....	2
Organizational Health Climate and Employee Health.....	3
Three Facets of Health Climate .....	6
Workgroup Facet of Organizational Health Climate .....	8
Supervisor Facet of Organizational Health Climate .....	10
Organization Facet of Organizational Health Climate.....	12
Causal Mechanisms .....	13
Behavioral Mediators.....	13
Psychological Mediator .....	15
Importance of the Three Facets.....	17
Study 1 Method.....	18
Participants.....	18
Measures .....	20
Analysis Strategy .....	25
Study 1 Results .....	26
Descriptive Statistics.....	26
Confirmatory Factor Analysis.....	27
Test of Direct Effects .....	28
Test of Indirect Effects.....	29
Health Behavior Intentions as a Mediator .....	30



Work-SOC as a Mediator.....	31
Cluster and Discriminant Function Analyses .....	33
Study 1 Discussion.....	35
Direct Effects .....	35
Indirect Effects.....	36
Cluster Analyses .....	39
Limitations .....	41
Study 2 Introduction .....	41
Multi-Level Theory and Organizational Climate .....	43
Aggregate Group-Level Health Climate.....	44
The Impact of Group-Level Health Climate.....	45
Mental Health.....	45
Work-Related Outcomes.....	47
Importance of the Three Group-Level Facets .....	52
Study 2 Method.....	53
Participants.....	53
Measures .....	55
Analysis Strategy .....	56
Study 2 Results .....	57
Descriptive Statistics.....	57

Data Aggregation .....	58
Power Analysis .....	60
Cross-Level Effects.....	61
Cluster Analysis .....	69
Interaction Among Group-Level Facets .....	71
Study 2 Discussion.....	72
Cluster Analysis .....	76
Group-Level Interactions .....	78
Limitations .....	79
Study 3 Introduction .....	80
Occupational Information Network .....	82
Job Control.....	83
Physical Job Demands and Occupational Risk.....	84
Working With Others.....	86
Study 3 Method.....	87
Participants.....	87
Measures .....	88
Analysis Strategy .....	90
Study 3 Results .....	91
Descriptive Statistics.....	91
Model Testing .....	91
Job Characteristics and Health Climate Facets .....	92

Test of Indirect Effects.....	93
Study 3 Discussion.....	94
Limitations .....	97
General Discussion .....	98
Practical Implications.....	101
Future Research .....	101
Summary .....	102
References.....	103
Tables .....	116
Figures.....	137
Appendix A.....	148

## LIST OF TABLES

Table 1. Study 1 Survey Descriptives .....	116
Table 2. Physiological Measures .....	117
Table 3. Study 1 Correlation Table.....	118
Table 4. Study 1 Final Model Structural Paths .....	119
Table 5. Study 1 Indirect Effects .....	120
Table 6. Study 2 Descriptives .....	123
Table 7. Individual-Level Correlation Table .....	124
Table 8. Aggregate Correlation Table .....	125
Table 9. RWG and ICCs .....	126
Table 10. Results from HLM Analyses for the Workgroup Facet.....	127
Table 11. Results from HLM Analyses for the Supervisor/Organization Facet.....	128
Table 12. Interaction HLM Results .....	129
Table 13. O*NET Variables .....	130
Table 14. Study 3 Descriptive Statistics .....	132
Table 15. Study 3 Correlation Table.....	133
Table 16. Study 3 Initial Model Structural Paths.....	134
Table 17. Study 3 Final Model Structural Paths .....	135
Table 18. Study 3 Indirect Effects .....	136

## LIST OF FIGURES

Figure 1. Overall Health Climate Model .....	137
Figure 2. Study 1 Final Model .....	138
Figure 3. Study 1 K-means Cluster Solution .....	139
Figure 4. Study 1 DFA Group Centroids .....	140
Figure 5. Level-3 Power Analysis .....	141
Figure 6. Level-2 Power Analysis .....	142
Figure 7. Study 2 Final Clusters .....	143
Figure 8. Study 2 DFA Group Centroids .....	144
Figure 9. OCB Interaction Plot .....	145
Figure 10. Performance Interaction Plot.....	146
Figure 11. Study 3 Final SEM Model.....	147

## **Organizational health climate: Three facets and outcomes of relevance to organizations**

Organizations can have a major impact (both negative and positive) on employee health because of the great amount of time that individuals spend at work. An interest in promoting employee health has partially stemmed from both the increase in chronic disease as a leading health issue as well as from the rapidly increasing health care costs in the United States (McLeroy, Bibeau, Steckler, & Glanz, 1988; National Center for Health Statistics, 2007). Organizational health is widely studied because of the impact that it has for both employees as well as employers. A healthy organization has been defined as one that “maximizes the integration of worker goals for well-being and company objectives for profitability and productivity” (Sauter, Murphy, & Hurrell, 1990). Theoretical research papers have discussed the assumed components of a healthy organization and also what the benefits of being characterized as a healthy organization might be. However, less attention has been given to empirically verifying the importance of being a healthy organization. In order to approach this research question empirically, it is first important to consider the degree to which important aspects of a healthy organization can be assessed, either in a single measure or via multiple measures. To this end, in the current study, organizational health climate is considered an essential component of a healthy organization because of its potential to be measured and empirically evaluated in relation to multiple health and work outcomes that would be important to organizations.

An understanding of the impact of healthy organizations and the relationship between work and health in general is relatively complex and requires the synthesis of theories, frameworks and past evidence from disciplines such as workplace health promotion, human development, macroergonomics, epidemiology and social psychology, as well as occupational health psychology. The current study seeks to examine employee health from an integrative

perspective consistent with the complexity of employee health. A paradigm that can be useful in studying this complex relationship between work and health is the social ecological model because it offers a systems perspective (Ettner & Grzywacz, 2001).

### **Social-Ecological Systems Perspective**

The social-ecological systems perspective offers a framework for examining the interrelations among the environment, human behavior, and individual well-being (Stokols, 1996). The social-ecological systems perspective also recognizes interactions between an individual and the social and physical environment in consideration of related outcomes, suggesting that multiple levels of influence affect behavior. In the organizational context, what this means is that there are many things to consider when examining the determinants of employee health and well-being. For example, the ecological systems perspective would suggest that employee health is simultaneously determined by individual's dispositions, resources, and characteristics, as well as his/her interactions with the work environment (Bronfenbrenner & Morris, 1998; Ettner & Grzywacz, 2001).

In the field of health promotion, the ecological model has been widely used as efforts for behavior change have shifted in focus from only behaviors of individuals to also including social and environmental factors. Ecological systems have also begun to be considered in the occupational health context. An ecological approach to occupational stress considers that factors such as the context in which the job stress occurs are important in examining stress in addition to an individual worker's characteristics (Salazar & Beaton, 2000). In the current study the fundamental concepts of the ecological systems model are considered in understanding the multiple influences of employee health. Specifically, this framework provides the basis for the importance of examining organizational health climate as the context in which employee health

develops. Further, through an ecological lens, the three facets of organizational health climate, as measured by the Multi-faceted Organizational Health Climate Assessment (MOHCA; Zweber, Henning, & Magley, under review), can be expected to impact employee health and well-being in complex ways.

### **Organizational Health Climate and Employee Health**

Before examining organizational health climate and its relationship to employee health and well-being, it is important to define this construct. Organizational climate has been defined as the perceptions that people have of their work settings that can be based on actual or inferred events as well as practices and procedures that occur in the workplace (Schneider, 1975). However, when researchers and organizations are interested in studying specific workplace outcomes, climate is often conceptualized as a climate for something more specific, such as “climate for safety” (Carr, Schmidt, Ford & DeShon, 2003). Therefore, in the interest of examining the outcome of employee health, the current study focuses on organizational health climate, which has been defined as “employee perceptions of active support from upper management, as well as supervisors and coworkers, for the physical and psychological well-being of employees” (Zweber, Henning, & Magley, under review). This conceptualization of organizational health climate suggests that there is a context of health that exists in organizations that is reflected by perceptions that employees have of the active support that exists from coworkers, supervisors and the organization itself around the idea of health.

Conceptually, this social context for health within an organization, or organizational health climate, is expected to be important because of the impact that it can have on organizational members. Research has found that the social and physical environments have an influence on the choices that individuals make, as well as the resources that are available to make



those choices and factors that influence health status (Green & Kreuter, 2005; Schneider & Stokols, 2009). This suggests that there should be a relationship between organizational health climate and employee health. In the validation of the MOHCA, it was predicted and found that organizational health climate was related to aspects of self-reported employee health such as job stress, burnout and fatigue (Zweber et al, under review). However, although the connection between organizational health climate and self-reported aspects of employee health has been made, a connection between organizational health climate and objective health outcomes has not yet been reported in the literature. A connection between organizational health climate and objective measures of employee physical health would provide a convincing case to organizational leaders about the importance of a positive organizational health climate.

Multiple theories of organizational stress can be used as theoretical explanations for the relationship between organizational health climate and employee health. Two theories that are particularly relevant to this relationship are the Conservation of Resources (COR) theory and the Allostatic Load (AL) theory. First, COR posits that stress is the result of an imbalance of lost and gained resources (Hobfoll, 1989). This theory suggests that a number of resources and the perception of these resources are needed in order to avoid a state of stress, which is a state of negative physical and mental health. Conceptualizing organizational health climate as a set of resources specific to health, COR theory would provide reason for why organizational health climate would be directly related to employee health. A supportive health climate would ideally provide individuals with the perception that there are resources regularly available within multiple levels of the organization to support his/her health and well-being . Thus, COR theory suggests that this perception of an abundance of readily available resources should prevent the

individuals from feeling a deficit of resources therefore preventing a stressful state even when stressors are present.

Additionally, AL theory complements COR theory in the explanation of the direct relationship between health climate and employee health. AL is more of a physiological approach to the explanation of stress (McEwen, 1998). This theory defines allostatic load as a state of chronic allostasis, which refers to the adjustment of various systems in the body in order to cope with real or imagined challenges to the state of homeostasis (Ganster & Perrewe, 2011). In other words, AL refers to the physical response in the body when it is overloaded trying to make adjustments due to outside stressors. In relation to organizational health climate, an organization with a positive health climate should proactively support employee health and well-being, therefore preventing an overabundance of stressors leading to an allostatic load. As opposed to an organization that is only reactive to employee health issues, a positive health climate should affect employees before a stressful state is reached, thereby preventing negative physical symptoms associated with an allostatic load.

Given the concepts from both Conservation of Resources and Allostatic Load, it is predicted that employee health will be a beneficial direct outcome of a positive organizational health climate.

**H1a:** Organizational health climate will significantly predict employee physical health based on physiological indicators.

The importance of organizational health climate to organizations can go beyond employee physical health and may also include employee mental health. This would be important to organizations because it is not only physical health that is driving health care costs and the cost of employee health for organizations. A conservative estimate of the cost of

occupational stress is \$100 billion annually to businesses in the United States (Landsbergis, Vivona, & Vaughan, 1995). This high cost associated with job stress has driven many organizations to develop interventions and programs to promote and maintain both the mental health as well as the physical health of their employees (Grawitch, Trares, & Kohler, 2007).

The Conservation of Resources theory can be similarly applied to employee mental health and its relationship with organizational health climate as they were with the relationship between employee physical health and organizational health climate. The definition of organizational health climate includes psychological as well as physical health, which therefore suggests that in order for an organization to have a positive organizational health climate they must also support employee mental health. Conservation of resources theory would suggest that the presence of resources and support for employee health and well-being in the organization would help to prevent or lessen the effects of strain as a result of stressors because although employees may perceive a threat or loss of resources as a result of stressors, they would also perceive the presence of resources that they could access from the organizational climate.

Therefore Hypothesis 1b states:

**H1b:** Organizational health climate will significantly predict employee mental health.

### **Three Facets of Health Climate**

The discussion up until this point has been focused on organizational health climate in general, however the construct can be explored further by breaking it down into its three facets as measured by MOHCA: workgroup, supervisor and organization. These three facets were conceptualized in the construction of the MOHCA scale due to research on how workplace climates emerge (Zweber et al., under review). Previous research literature has determined that an individual's perceptions of their workplace develop not only out of interactions with their

coworkers, but also out objective aspects of the organization as well as a mix between the two, including how certain policies are implemented by supervisors (Schneider & Reichers, 1983). The interest in the current study to explore these three facets of health climate connects back to the social-ecological systems perspective being used as a general framework for the current study, the work system is comprised of multiple levels containing numerous influences on employee health and well-being. Because these three facets match up with organizational levels, the social ecological perspective would posit that these three facets would each have an impact on employee health.

Although research has demonstrated that aspects of general climate such as organizational support, supervisor support and coworker support are associated with psychological health and workplace attitudes and outcomes (Wilson, DeJoy, Vandenberg, Richardson, & McGrath, 2004), the specific contributions of these three facets of organizational health climate on health and work outcomes have not been examined. It is hypothesized in the current study that each of these three facets impact employee health because of the different contextual sources of the three facets. A differential impact on employee health is expected because the nature of interactions and interfaces between the employee and his/her coworkers is generally different than the interaction between the employee and his/her supervisor or between his/her organization (Leiter & Maslach, 1988). The following exploration of the three facets of organizational health climate seeks to both explore why and how each of these facets individually impacts employee physical and mental health as well as whether it is important to have strength in all three of these MOHCA facets.

## **Workgroup Facet of Organizational Health Climate**

The first of the three facets of the MOHCA measure of organizational health climate is the workgroup facet, which focuses on the support for health from immediate coworkers. Coworkers, for many individuals, can be a major source of social support because of the relatively frequent interactions between an individual and his/her coworkers (Ganster & Victor, 1988). If this is applied to the support of health specifically rather than to general social support, which is the case in organizational health climate, it can be expected that this specific continuous support from coworkers for an individual's health and well-being will have a direct impact on this employee's physical and mental health.

A number of scientific studies have examined the impact of coworker support on coping as well as on many negative workplace experiences. It is often looked at as a moderator in the relationship between negative experiences/workplace stress and negative workplace outcomes, suggesting that coworker support can act as a buffer in a number of situations. For example, a number of researchers have found empirical evidence that the quality of interpersonal relationships at work can buffer the impact of role stress on negative outcomes (Kahn, Wolfe, Quinn, Snoek & Rosenthal, 1964). However, mixed results from the buffering hypothesis suggest that that social support can both directly affect health and well-being, as well as buffer the negative effects of a stressor (Cohen & Wills, 1984; Gottlieb, 1983). The current study is focused solely on the direct effect of support for health on employee physical and mental health instead of only being focused on the buffering effect that social support might have.

Although much research on the effects of social support have come from a 'stressful life-events' paradigm, organizational stress is unique in that it is more chronic than episodic and therefore is considered to have a larger effect on employee health (Ganster & Victor, 1988).

Persistence of workplace stressors suggests that the role of social support, and specifically support from coworkers, might be consistently necessary rather than on an event-by-event basis. Thus, coworkers who regularly provide resources, both tangible and intangible, for improving and maintaining health and well-being are important. The presence of a constant stream of resources and support benefiting employee health and well-being would contribute to the development of a strong climate around being supportive, as in the workgroup facet of organizational health climate.

Examining the role of the workgroup facet of health climate from the perspective of multiple stress theories, it is expected that this facet will directly impact employee health. Conservation of resources theory (COR) posits that stress is the result of actual or threatened loss of resources or the lack of gained resources after an individual has invested their own resources (Hobfoll, 1989). Organizational health climate, as measured by MOHCA, can be seen as a set of resources, specific to employee health and well-being, that are available to the employee. In the workgroup facet this could consist of support for health and well-being from an individual's coworkers, with this support representing a type of resource. Resources for employee health and well-being could also be more objective than social support such as a coworker picking up some of the workload of a sick employee. This would suggest that a lack of continuous support and resources from coworkers specific to health and well-being would impact an individual's health. Therefore Hypothesis 2 states:

**H2a:** The workgroup facet of health climate will significantly predict employee physical health.

**H2b:** The workgroup facet of health climate will significantly predict employee mental health.

## **Supervisor Facet of Organizational Health Climate**

Although an individual's coworkers can be predicted to contribute to the perceptions of organizational health climate and influence his/her health based on previous research, an individual's supervisor might also play a significant role. For this reason, the supervisor facet is also seen as an important component of organizational health climate. Supervisors, for example, can reduce the success of a worksite stress and health intervention by expressing negative opinions about the usefulness of the program (Saksvik, Nytro, Dahl-Jorgensen & Mikkelsen, 2002). In their qualitative study, Saksvik and colleagues (2002) highlighted the important barrier of management in the implementation of occupational stress and health interventions, noting that although the target consumers of these programs are the employees, middle management plays a large role in determining intervention success. The importance of middle management comes out of their ability to control things such as the availability of employee time to participate in health programs, as well as resources that are available. This evidence for the integral role of middle management is important not only in the implementation of workplace health programs but also in the context of organizational health climate because this would suggest that the actions, beliefs, and support from supervisors related to health is something that will be perceived by the employees and reacted to.

Similar to the previous research on coworker support and its relevance to the workgroup facet of health climate, general supervisor support has been widely studied but support specific to promotion of health has not. Although general supervisor support will likely act differently than the more specific supervisor support for health, general findings and frameworks from previous research on supervisor support can help inform the theoretical reasoning behind how the supervisor facet of organizational health climate will function and why it should be related to

employee health outcomes. Because of the emotional, instrumental, informational and social support that supervisors provide, as well as their ability to prevent certain job stressors, supervisors might have an effect on employee health (Kawakami, Araki, Kawashima, Masumoto, & Hayashi, 1997; Kawakami, Kobayashi, Takao, & Tsutsumi, 2005). These types of supervisor support might also be applicable in the context of organizational health climate in that supervisors can offer this type of support and encouragement for employee health and well-being, creating a positive atmosphere for health in their workgroup(s).

Previous research on general supervisor support has found evidence for both the main effect and buffering effect of supervisor support on employee health (Winnbst, Marcelissen & Kleber, 1982). Jones-Johnson and Johnson (2001), while looking for a buffering effect of supervisor support, did not confirm that hypothesis but instead found that supervisor support had a direct relationship with the psychosocial stress of employees. This was similar to findings in previous studies including one that found that supervisor support has a direct effect on reported psychological symptoms (Papper, 1983). Based on this previous research, as well as based on the COR theory as explained in the previous section, it is expected that the presence of positive resources and support for health from one's supervisor will improve or maintain employee health. Therefore the next set of hypotheses state:

**H3a:** The supervisor facet of health climate will significantly predict employee physical health

**H3b:** The supervisor facet of health climate will significantly predict employee mental health.



## **Organization Facet of Organizational Health Climate**

The supervisor and the workgroup members can have an influence on the perceptions of support for health in the workplace, however the organization itself likely plays a major role as well. Although the supervisor and workgroup members are generally closer and more salient to the employee, the contribution of the organization toward health might be more in terms of instrumental support. Instrumental support has been defined as involving behaviors that directly help the person in need (House, 1981). This would include things such as providing good benefits for health in terms of health insurance as well as setting programs and policies in place in the workplace for promoting and maintaining the health of their employees. As in the discussion of the previous two facets of organizational health climate, little to no research has been done to determine the specific type of support for employee health and well-being exemplified in the construct of organizational health climate. However, numerous studies have examined the concept of perceived organizational support, its antecedents and consequences, as well as its role in the stressor-strain relationship, and the past research and frameworks used can be essential in understanding and theoretically predicting the role that the organizational facet of health climate can play.

Organizational support theory suggests that individuals have the tendency to assign humanlike characteristics to the organization itself, which in turn results in creating perceived organizational support (Eisenberger, Huntington, Hutchison, & Sowa, 1986). This is exemplified by individuals feeling a sense of caring from their organization. In the context of organizational health climate, the perceptions of the employees are about how much the organization cares for, supports and encourages employee health and well-being. This support from the organization, both instrumental and emotional, can be seen as a set of resources regularly available to the

individual. Therefore, COR theory would suggest that a positive organizational facet of health climate would be related to employee physical and mental health.

**H4a:** The organization facet of health climate will significantly predict employee physical health.

**H4b:** The organization facet of health climate will significantly predict employee mental health.

### **Causal Mechanisms**

Taken together, the workgroup, supervisor, and organization facets of organizational health climate are all hypothesized to affect both the physical and mental health of the employee. However, a question that still remains is what are the causal mechanisms through which the health climate facets affect employee health? Although direct relationships between these facets and health are expected as hypothesized previously, it is also likely that strong mediational relationships exist. To understand what potential causal mechanisms might exist, a further review of the social support literature was undertaken. A review of the social support literature provides strong support for the link between social support and health but there is less evidence for the causal mechanisms through which support affects health. However, some theorists have identified categories of mediators in these relationships that include behavioral and psychological factors (Ganster & Victor, 1988).

### **Behavioral Mediators**

First, in examining the behavioral component of a causal mechanism, it is theorized that social support can encourage positive as well as negative changes in health behavior. For example, people with positive social support networks might be encouraged by individuals in this network to engage in healthier behaviors (House, 1981). Another relatively salient example

of this phenomenon can be seen in adolescents when their changes in behavior are influenced (whether negatively or positively) by support from their peers. These examples on how social support can influence health might be even stronger if the social support itself was directly related to health. In the context of organizations, support from coworkers, supervisors and the organization for health and well-being could potentially prevent exposure to stressful experiences, help to reduce the severity of stressful exposures, and/or provide support after a stressful experience has occurred (Cohen & Wills, 1983; Ganster & Victor, 1988; Gottlieb, 1983). This can occur through information, advice, guidance about decisions, information about problem-solving approaches for certain stressors, and instrumental support from coworkers, supervisors and/or the organization (Wills, 1985). These continuous interactions are like a network and therefore it is predicted in this study that these social support networks at work for health and well-being will impact intentions to engage in healthy behaviors which will, in turn, affect employee physical and mental health.

This theory of behavioral mechanisms through which social support affects employee health can be applied to the commonly used Theory of Planned Behavior. This theory suggests that behavior is determined by behavioral intentions, and these intentions are affected by subjective norms, perceived control and attitudes about the behavior (Ajzen, 1991). Using this influential framework, it is hypothesized that intentions to engage in healthy behaviors will mediate the relationship between the subjective health norms in the organization. In his original conceptualization of the theory of planned behavior, Ajzen (1991) considered subjective norms to refer to the perceived social pressure to perform or not perform a certain behavior. These subjective health norms can be considered the three facets of MOHCA because these health climate facets are conceptualized not only as a set of resources specific to employee health, but

also as the norms by which individuals view and treat health in the organization. For example, in the supervisor facet there is an item “my supervisor encourages participation in organizational programs that promote employee health and well-being,” which suggests that there can be a norm of the behavior of participation in health programs in the organization. The theory of planned behavior suggests that these norms will have a direct effect on behavioral intentions and in turn impact employee health behaviors which can be indicated through their health status.

***H5a:*** Intentions to engage in healthy behaviors will mediate the relationship between the coworker facet of health climate and employee physical health.

***H5b:*** Intentions to engage in healthy behaviors will mediate the relationship between the coworker facet of health climate and employee mental health.

***H5c:*** Intentions to engage in healthy behaviors will mediate the relationship between the supervisor facet of health climate and employee physical health.

***H5d:*** Intentions to engage in healthy behaviors will mediate the relationship between the supervisor facet of health climate and employee mental health.

***H5e:*** Intentions to engaged in healthy behaviors will mediate the relationship between the organization facet of health climate and employee physical health.

***H5f:*** Intentions to engage in healthy behaviors will mediate the relationship between the organization facet of health climate and employee mental health.

### **Psychological Mediator**

Other than the behavioral pathway through which social support can influence the physical and mental health of employees, there is also the psychological pathway to consider. The psychological mediator in this relationship is based on the assumption that the support from others leads to greater positive affect and a better psychological state in general, which then leads

to better physical and mental health (Cohen & Syme, 1985; Ganster & Victor, 1988; Kessler & Mcleod, 1985). Social support can enhance employee health by preventing the psychological consequences of stress (Ganster & Victor, 1988). Stress has been found to lead to lower levels of self-esteem, lowered levels of self-efficacy and lack of perceived social control (Wills, 1985). Therefore, if an employee experiences a climate where they feel their health is both proactively and reactively supported by their coworkers, supervisors and their organization, this may lead to a better psychological state and indirectly to better mental and physical health.

Although this general psychological mediator mechanism makes sense theoretically, in order to test this relationship empirically, a more specific construct that represents a psychological state needs to be determined. In the current study we examine workplace sense of coherence (work-SOC) as a mechanism through which it is expected that health climate facets will impact employee physical and mental health. Work-SOC is defined as the “perceived comprehensibility, manageability and meaningfulness of an individual’s current work situation” (Vogt, Jenny & Bauer, 2013). To further explain these components of work-SOC, Vogt and colleagues (2013) define comprehensibility as “the extent to which a work situation is perceived as structured, consistent and clear,” manageability as “the extent to which and employee perceives that adequate resources are available to cope with the demands in the workplace,” and meaningfulness as “the extent to which a situation at work is seen as worthy of commitment and involvement.”(p. 2).

While the construct of work-SOC is relatively new and less empirical research has tested its effects, general SOC has been found to result in better physical and mental health (Kinman, 2008). Additionally, studies have found that changes in organizational climate have been associated with SOC, and that SOC partially mediates the relationship between good

organizational climate and well-being (Feldt, Kinnunen, & Mauno, 2002) as well as mediates the relationship between psychosocial work environment and stress (Albertsen, Nielsen, & Borg, 2001). These findings in addition to the conceptualization of work-SOC as an individual psychological state indicate that the meaningfulness, manageability and comprehensibility of an individual's work could be influenced by the perceptions of a climate for the support of employee health and well-being from coworkers, supervisors and the organization.

**H6a:** Work-SOC will partially mediate the relationship between the workgroup facet of health climate and physical health.

**H6b:** Work SOC will partially mediate the relationship between the workgroup facet of health climate and mental health.

**H6c:** Work SOC will partially mediate the relationship between the supervisor facet of health climate and physical health.

**H6d:** Work SOC will partially mediate the relationship between the supervisor facet of health climate and mental health.

**H6e:** Work SOC will partially mediate the relationship between the organization facet of health climate and physical health.

**H6f:** Work SOC will partially mediate the relationship between the organization facet of health climate and mental health.

### **Importance of the Three Facets**

The hypotheses and theoretical backgrounds up until now have sought to answer the questions of why organizational health climate is important as well as why and how the three facets of health climate impact employee physical and mental health, yet a question that remains unanswered is whether all three facets are necessary in order to benefit from a healthy

organizational climate. Viewing this question from a social-ecological perspective, the underlying influential framework for the general basis of this study, multiple levels of influence are co-occurring to impact employee physical and mental health. The social-ecological perspective considers the importance of the context in which the job stressors that ultimately effect health are occurring (Salazar & Beaton, 2000). This context would generally consist of all three of the facets of health climate, and given the fact that these are part of a single work system that is dynamic and constantly changing, it may be important to consider their combined effects on health. Given the importance outlined previously of each type of supportive climate for health (workgroup, supervisor, and organization) it is expected that an organization that is lacking in one or more of the areas will not experience the full benefits in terms of employee health and well-being that organizations not lacking in one or more of the facets would. Employee well-being can be broadly defined to include aspects of mental health, burnout and stress as well as other work-related well-being constructs such as work ability and workplace civility norms. Healthy climate likely impacts these aspects of well-being and therefore it is predicted that individuals who differ in terms of the three facets of health climate will differ in terms of their work-related well-being. Therefore next set of hypothesis states:

**H7:** Employees who perceive a positive climate in all three facets of health climate will experience more positive health and workplace outcomes than employees who perceive one or more of these facets to be not as strong.

## **Study 1 Method**

### **Participants**

A dataset collected as part of a 5-year study with the Department of Corrections (DOC) in a Northeast state was used to test the hypotheses in Study 1. This study, entitled Health

Improvement Through Employee Control (HITEC) seeks to integrate workplace health protection (safety) with health promotion in order to improve the health and well-being of the corrections officers population. HITEC includes multiple waves of data collection involving an all employee survey as well as physical assessments. Individuals were compensated \$50 for completing both the survey at the physical assessment. Although the full \$50 was not received unless both components were completed, it was not mandatory to do either of these tasks. The all employee survey was a paper based-survey which assessed a number of constructs in addition to the ones used in this study which included ergonomics, workplace behaviors, workplace attitudes, and individual characteristics. The physical assessments were completed on the employees work time within their facility. The assessments took about fifteen minutes to complete and consisted of height, weight, waist circumference, handgrip strength, flexibility, blood pressure, resting heart rate, body fat percentage and a one minute physical test on an exercise bike.

An initial sample of 372 participants took the survey. Of these participants, 325 of them also completed a physical assessment. Due to the effect it could have on certain physiological outcomes, participants who were currently taking medication to control their blood pressure (40 participants) were also excluded from analyses. Participants who answered yes to having a fever or active infection at the time of the study (1 participant) were also excluded because their physical assessment measures could be influenced by their current state of sickness and therefore not serve as an accurate indicator of their overall health.

These exclusion procedures left 284 participants retained in the data. However, 53 of those participants could not be included in the analyses due to incomplete, missing or fraudulent data on the variables needed for the current analyses, leaving a final sample size of 231.



The final sample had a mean age of 43 years and 46% worked first shift. Males made up the majority of the sample (69%), which is indicative of true gender ratios in corrections settings. Average job tenure of the sample was 11 years and the 38% of the sample had a college degree or higher. 69% of the sample identified as white.

## **Measures**

Items for each of these scales are listed in the Appendix unless otherwise noted. Item response scales are a 1(Strongly Disagree) to 7(Strongly Agree) Likert scale unless otherwise noted.

**Health Climate.** The workgroup, supervisor, and organization facets of organizational health climate were measured using the Multi-faceted Organizational Health Climate Assessment (MOHCA, Zweber et al., under review). The original MOHCA scale consisted of 9 items, with 2 items for the workgroup facet, 3 for the supervisor facet and 4 for the organization facet. A sample item from this scale is “My supervisor encourages participation in organizational programs that promote employee health and well-being.” However, one of the supervisor items was excluded due to its effect on the alpha of the scale and results of exploratory and confirmatory factor analyses which showed that this negatively worded item was not fitting well with the other two supervisor facet items. This resulted in the overall scale ( $\alpha=.88$ ) and the three facets being tested with 2 items for the workgroup facet ( $\alpha=.57$ ), 2 items for the supervisor facet ( $\alpha=.93$ ) and four items for the organizational facet ( $\alpha=.88$ ).

**Physical Health.** In this study we conceptualize physical health as a state of optimal functioning in terms of physical standards set forth by the Centers for Disease Control (CDC) and previous research literature. Optimal functioning was based off of standards set for each of the individual measures, which classified participants into groups such as average, above average

or below average. The specific indices of interest in the current study were blood pressure, body fat percentage and handgrip strength. A description of each of these measures, how they were collected and how they were dealt with in the analyses follows.

**Blood pressure.** Blood pressure is used as an indicator of physical health in this study because research has continuously found that there is a direct positive relationship between blood pressure and cardiovascular risk (Whelton et al., 2002). In this study, blood pressure was measured using an automatic blood pressure monitor. Individuals were then categorized based on their systolic and diastolic blood pressure into “normal,” two levels of “pre-hypertension,” and three levels of “hypertension.” These categories were ordered and evenly spaced indicating they could be used similarly to a Likert scale in the analyses.

**Body fat percentage.** Body fat percentage is used as an indicator of physical health because an elevated level of body fat is related to increased morbidity and mortality and particularly with cardiovascular disease (Deurenberg, Yap, & van Staveren, 1998). In this study body fat percentage was tested using a Bioelectrical body Composition Analyzer (Quantum X, RJL Systems, Clinton Township, MI). Participants were instructed to remove their right sock and any jewelry or metal, including utility belts, and lie down on the examination table. Sensors were placed on the participant’s right hand and right foot and the device sends a quick current between these sensors (participants could not feel this) to measure resistance and reactance. Resistance and reactance were then entered into an access database which had the formula for calculating body fat percentage. Due to the gendered nature of body fat percentage (females should have greater body fat than males) participants were first classified based on standards for their gender into “well below

average risk,” “below average risk,” “average risk,” “above average risk,” and “well above average risk.” These categories were ordered with equal spacing in between them meaning they could be used similar to Likert scales in the analyses.

**Handgrip Strength.** Handgrip strength was used as an indicator of physical health because it has been found to be associated with lower body weight, presences of chronic diseases and physical inactivity which are all predictors of increased mortality (Rantanen, Harris, Leveille, Visser, Foley, Masaki, & Guralnik, 2000). Handgrip strength was measured using a hand dynamometer (JAMAR 5030 J1). Participants were asked to sit in a chair and hold the dynamometer in their hand. The dynamometer size was adjusted based on the participant’s preferred comfort with the device. Participants were then asked to squeeze the device as hard as they could. This was done on both the left and right hands. Because strength is associated with body size which can also be associated with gender, it is necessary to examine strength relative to a person’s size (Rantanen et al., 2000). Therefore in the current study analyses used handgrip strength as a proportion of the persons weight to their handgrip strength.

**Mental Health.** Mental health is being defined in this study as a state of well-being where individuals can cope with normal stresses of their life and work productively. For the purpose of this study, this would involve an absence or low level of depression, burnout, and stress and an average or above average score on the SF-12 which is compared to national norms. These measures and their usage in the current analyses are described below.

**Burnout.** Burnout was measured using 4 items from the Oldenburg Burnout Inventory (Demerouti, Bakker, Nachreiner & Schaufeli, 2000). An example item from this scale is “More and more often I talk about my work in a negative way.” The original scale in the

study survey consisted of 5 items, however one of these items was reverse coded and did not fit well with the other items as exemplified in preliminary exploratory factor analysis and confirmatory factor analysis. Therefore four items were used for the study analyses ( $\alpha=.81$ ). This scale was reverse coded in the current analyses so that higher scores indicate better mental health (lower levels of burnout). Burnout has been conceptualized as having multiple dimensions including exhaustion and disengagement (Demorouti et al., 2000). Two items from each of these dimensions were used for study analyses, however factor analysis results indicated that they could factor together as one scale of burnout rather than being examined separately.

**Stress.** Stress in General/Job Stress was measured using the 6-item Stress in General/Job Stress measure (Stanton, Balzer, Smith, Parra & Ironson, 2001). The response options for this scale were 0=no, 1.5=? and 3=yes, meaning that higher scores on this scale indicate higher levels of stress. However, for this study this scale was reverse scored so that higher scores would indicate better mental health (less stress). An example item from this scale is “In general, I think my job is pressured.” This scale can be broken down into factors of pressured stress and threat stress, however factor analyses indicate that these items could be used together as one measure of stress. Therefore, the full 6-item measure was retained for analysis in this study ( $\alpha=.86$ ).

**SF-12.** The short form health assessment survey (SF-12; Ware, Kosiniski, Turner-Bowker, & Gandek, 2002) was used to assess mental health. This survey uses 12 questions and an equation to compare the health of employees to the general population of the United States. A score of 50 on the scale is comparable to the average health of the

United States and a lower score indicates poorer health. (This measure is proprietary and therefore is not provided in Appendix A.)

**Depression.** Depression was measured using a ten-item scale (Radloff, 1977). The response option for this scale ranges from 1= rarely or none of the time to 4= all of the time (5-7 days per week). An example item from this scale is “I felt that everything I did was an effort. Higher scores on this scale indicate higher levels of depression, however in this study responses were reverse coded for analyses so that higher scores would indicate better mental health. ( $\alpha=.77$ ).

**Behavioral Intentions.** Behavioral intentions were measured using an unpublished scale that has been used in previous studies (Miranda, Punnett, Gore & Boyer, 2011; Miranda, Punnett, Gore, & ProCare Team, 2014). An example item from this scale is “Indicate how ready you are to make the changes or improvements in your health in the following areas: be physically active.” Initial tests on this seven item scale revealed that two of the items should be deleted for both empirical and conceptual reasons. Therefore, the final scale used in this study consisted of 5 items. The item response scale ranged from 1= “No present interest in making changes in the next 6 months” to 5= “already do this regularly.” The full scale can be seen in Appendix A.

**Work SOC.** Workplace sense of coherence was measured using 9 items to make up the 3 expected factors of meaningfulness, manageability and comprehensibility (Vogt et al., 2013). These items were translated into English for the project at DOC for validation purposes. An example item from this scale is “To what extent do you agree with the following statements about your job; (1) easy-to-influence – (7) impossible-to-influence?” Each of the items in this scale had two terms at opposites ends of a spectrum and responses could be rated from 1 to 7. Due to the results of exploratory and confirmatory factor analyses to examine the factor structure

of this variable, Work-SOC was split up into its three factors for analysis in the proposed model. This empirical evidence as well as the conceptual reasoning behind the definition of three separate factors led to the decision to examine meaningfulness, manageability and comprehensibility as three separate mediators. The full work-SOC scale can be seen in Appendix A.

**Work-Related Well-Being.** In addition to some of the variables used in the mental health latent variable as described earlier, work ability and workplace civility norms were used in the discriminant function analysis as work-related well-being constructs.

**Civility norms.** Civility norms was measured using the 4-item Civility Norms Questionnaire Brief (Walsh, Magley, Reeves, Davies-Schribs, Marmet, & Gallus, 2011) An example item is “rude behavior is not accepted by your coworkers” ( $\alpha=.86$ ).

**Work Ability.** Work ability was measured using a four-item scale (Ilmarinen, Tuomi, Eskelinen, & Nygard, 1991). The response scale ranged from 0= cannot work to 10= Work at best. An example item is “Thinking about the physical demands of your job, how do you rate your current ability to meet those demands” ( $\alpha=.90$ ).

## **Analysis Strategy**

Structural equation modeling techniques were used to test the hypothesized models. A measurement model was first fit to the data and exploratory and confirmatory factor analyses were performed on all measures used in the model. Next the fully-saturated theoretical model was tested. Given that there was some theoretical reasoning for examining the fully saturated model but also reason to posit that some paths might be statistically stronger than others, the model was next revised based on theory and empirical support (significant increases in model fit).

Multiple fit indices were used to examine the model fit. The chi square statistic was examined due to its common use in structural equation modeling, however because this measure is greatly affected by sample size, in samples greater than 200 it is very unlikely to get a non-significant statistic. Therefore, three other fit statistics were used in determining model fit: the Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). A SRMR value close to .08, a CFI of .95 or higher, and an RMSEA of less than .06 indicates good fit (Hu & Bentler, 1999).

Although structural equation modeling was used to test Hypothesis 1a through Hypothesis 6f, k-means clustering and discriminant function analysis was used to test Hypothesis 7.

## **Study 1 Results**

### **Descriptive Statistics**

For all of the survey variables used in Study 1 descriptive statistics including mean, standard deviation, minimum, maximum, number of items and coefficient alpha are presented in Table 1. With the exception of the SF-12 Mental variable, all scales were created using a mean of the items. The SF-12 Mental was computed based on the validated algorithm that is associated with use of this scale. As reported in Table 1, means for each of these scales indicate that most scores were around or slightly above the midpoint for each of the scales. The mean of the SF-12 Mental (M=48.77) is slightly lower than the national average which is 50. With the exception of the workgroup facet of health climate and the manageability factor of work-SOC, all coefficient alphas indicate that scales had adequate reliability (above .70). The workgroup facet of health climate and manageability factor both had less than desirable reliability but were still used in study analyses. In future use of these scales it might be useful to add an additional item to each

of these scales in hopes of improving reliability estimates. Table 2 provides descriptive statistics on each of the objective physical health measures in this study. Also, Table 3 provides zero-order correlations among all constructs used in Study 1.

### **Confirmatory Factor Analyses**

Before proceeding with the testing of the structural model, latent variables were examined in confirmatory factor analyses to ensure latent constructs were appropriate. Additionally, each of the scales used in the model as observed variables were explored via exploratory and confirmatory factor analyses as well as coefficient alpha. Results indicate that physical health was not appropriate to measure as a latent construct. With three indicators of the latent factor of physical health, this CFA model was just-identified, and therefore fit measures could not be determined. However, none of the paths from the three indicators to the latent factor were significant (handgrip strength:  $B=1$ , body fat:  $B=1.29$ ,  $p>.05$ ; and blood pressure:  $B=.21$ ,  $p>.05$ ). Therefore, based on this empirical evidence along with conceptual reasons for separating these physiological measures from a single latent construct, these three measures were used as separate observed outcomes in the final model testing. Mental health was also examined as a latent factor. Results from this CFA indicate that the model has good model fit ( $SRMR=.04$ ,  $CFI=.97$   $RMSEA=.14$ ). Additionally, all of the paths from the four indicators (SF-12, job stress, burnout, and depression) to the latent factor of mental health were significant. Therefore mental health was retained as a latent factor for final model testing.

When examining the scales used for all of the other constructs in the model, results indicate that all of the scales factored in ways that were consistent with prior published work, with the exception of work-SOC. Work-SOC has been examined in the literature as a one-factor construct despite its conceptualization as being comprised of meaningfulness, manageability and



comprehensibility. However, exploratory factor analysis indicated that a one-factor solution did not fit the data well, and confirmatory factor analysis confirmed that the three factor (SRMR=.05, CFI=.96, RMSEA=.08) solution fit better than the one-factor solution (SRMR=.10, CFI=.71, RMSEA=.10). Therefore, meaningfulness, manageability and comprehensibility were examined as three separate mediators during final model testing as opposed to all together as one construct of work-SOC as originally hypothesized.

### **Test of Direct Effects**

An initial model was tested to examine the direct relationship between overall health climate and mental and physical health as hypothesized in Hypothesis 1a and Hypothesis 1b. This model had adequate model fit (SRMR=.05, CFI=.96, RMSEA=.05). This model can be seen in Figure 1. Results from this model indicate that the direct paths from overall health climate to handgrip strength, blood pressure and body fat percentage were not significant. Therefore Hypothesis 1a was not supported. However, results did show that the path from overall health climate to the latent factor of employee mental health was significant ( $B = .24, p < .05$ ), indicating support for Hypothesis 1b.

The next model was then tested which separated out overall health climate into its three facets: workgroup, supervisor and organization. The model fit the data moderately well (SRMR=.06, CFI=.94, RMSEA=.06), however, a number of the paths were not statistically significant. Hypothesis 2a and Hypothesis 2b posited that the workgroup facet of health climate would significantly predict employee physical and mental health, respectively. Results indicate that neither the paths from the workgroup facets to handgrip strength ( $B = -.10, p > .05$ ), blood pressure ( $B = 0, p > .05$ ) and body fat ( $B = -.03, p > .05$ ), nor the path from the workgroup facet to mental health ( $B = .13, p > .05$ ) were statistically significant, and therefore these two hypotheses

were not supported. Hypothesis 3a and Hypothesis 3b posited that the supervisor facet of health climate would significantly predict employee physical and mental health, respectively. Results indicate that neither the paths from the supervisor facet to handgrip strength ( $B = -.04, p > .05$ ), blood pressure ( $B = .02, p > .05$ ) or body fat ( $B = .04, p > .05$ ), nor the path from the supervisor facet to mental health ( $B = -.02, p > .05$ ) were statistically significant, and therefore these two hypotheses were not supported. Lastly, Hypothesis 4a and Hypothesis 4b posited that the organizational facet of health climate would significantly predict employee physical and mental health, respectively. Results indicate the paths from the organizational facet to handgrip strength ( $B = .14, p > .05$ ), blood pressure ( $B = -.01, p > .05$ ) and body fat ( $B = -.05, p > .05$ ) were not statistically significant. However, the path from the organizational facet to mental health was statistically significant ( $B = .19, p < .05$ ). Therefore while Hypothesis 4a was not supported, Hypothesis 4b was supported.

### **Test of Indirect Effects**

After examining hypotheses 2 through four on the direct effects of each of the three facets of health climate on physical outcomes and employee mental health, mediator variables were added into the model to examine potential indirect effects in addition to direct effects. Although the direct relationships between all three of the facets and the physical health outcomes as well as the direct relationships between the workgroup and supervisor facets and the outcome of mental health, were found to not be statistically significant in the previous model tested, direct effects for these two variables were not initially deleted from this analysis for model comparison purposes. The model that included all of the hypothesized effects had good model fit ( $SRMR = .05, CFI = .97, RMSEA = .06$ ). However when direct paths were deleted based on their non-significance, as found in the previous model, this model also had good model fit

(SRMR=.05, CFI=.97, RMSEA=.05). A chi square difference test was performed in order to choose which model to retain and the results indicated that the more parsimonious model should be retained ( $\Delta\chi^2(9)=6.35, p>.05$ ). Although this trimmed model fit the data well, not all paths were statistically significant. However, this model was retained for analyses because indirect effects can sometimes be significant even if direct effects are not significant (Hayes, 2009). The model used for Hypothesis testing can be seen in Figure 2. Model parameters from the testing of this model can be seen in Table 4.

Although direct effects were eliminated from the model indicating that mediation effects could not be found, indirect effects were examined in order to explore the relationship between the health climate facets and physical and mental health outcomes. Bootstrapping was used to test the significance of these indirect effects because bootstrapping provides more accurate estimates of confidence intervals regardless of the sample size, effect size or level of statistical significance (Mallinckrodt, Abraham, Wei, & Russell, 2006). These indirect effects and their confidence intervals as determined by bootstrapping can be seen in Table 5.

### **Health Behavior Intentions as a Mediator**

Hypothesis 5a posited that intentions to engage in healthy behaviors would mediate the relationship between the workgroup facet of health climate and employee health. Results indicate that this hypothesis was partially supported. There was a significant indirect effect of the workgroup facet on handgrip strength through behavior intentions (95%CI= -.06 to -.01). There was also a significant indirect effect of the workgroup facet on body fat percentage through behavior intentions (95% CI= -.08 to -.01). There was not a significant indirect effect of the workgroup facet on blood pressure through behavior intentions. Therefore, Hypothesis 5a was partially supported. Hypothesis 5b stated that intentions to engage in healthy behaviors would

mediate the relationship between the workgroup facet of health climate and employee mental health. Results indicate that this hypothesis was not supported because the indirect effect was not statistically significant.

Hypothesis 5c stated that intentions to engage in healthy behaviors would mediate the relationship between the supervisor facet of health climate and employee physical health. Results indicate that Hypothesis 5c was not supported because there were no significant indirect effects of the supervisor facet through health behavior intentions on handgrip strength, blood pressure, or body fat percentage. Hypothesis 5d posited that intentions to engage in healthy behaviors would mediate the relationship between the supervisor facet of health climate and employee mental health. Results indicate that this Hypothesis 5d was also not supported because there was no significant indirect effect.

Hypothesis 5e posited that intentions to engage in healthy behaviors would mediate the relationship between the organization facet of health climate and employee physical health. Results indicate that Hypothesis 5e was not supported because there were not significant indirect effects of the organization facet through health behavior intentions on handgrip strength, blood pressure, or body fat percentage. Hypothesis 5f stated that intentions to engage in healthy behaviors would mediate the relationship between the organization facet of health climate and employee mental health. Results indicate that Hypothesis 5f was also not supported because there was no significant indirect effect.

### **Work-SOC as a Mediator**

Hypothesis 6a posited that work-SOC would partially mediate the relationship between the workgroup facet of health climate and employee physical health. Results indicate that Hypothesis 6a was not supported because there were no significant indirect effects from the

workgroup facet through any of the three factors of work-SOC on handgrip strength, blood pressure or body fat percentage. Hypothesis 6b posited that work-SOC would partially mediate the relationship between the workgroup facet of health climate and mental health. This hypothesis was partially supported in that there was a significant indirect effect of the workgroup facet on mental health through the comprehensibility factor of work-SOC (95% CI= .02 to .11).

Hypothesis 6c stated that work-SOC would partially mediate the relationship between the supervisor facet of health climate and employee physical health. Results indicate that Hypothesis 6c was not supported. There were no significant indirect effects from the supervisor facet through any of the three factors of work-SOC on handgrip strength, blood pressure, or body fat percentage. Hypothesis 6d posited that work-SOC would partially mediate the relationship between the supervisor facet of health climate and employee mental health. Results indicate that Hypothesis 6d was not supported. There was not a significant indirect effect of the supervisor facet on employee mental health through any of the three work-SOC factors.

Hypothesis 6e posited that work-SOC would partially mediate the relationship between the organization facet of health climate and employee physical health. Results indicate that Hypothesis 6e was not supported. There were no significant indirect effects from the organization facet through any of the three factors of work-SOC on handgrip strength, blood pressure, or body fat percentage. Hypothesis 6f stated that work-SOC would partially mediate the relationship between the organization facet of health climate and employee mental health. Results indicate that Hypothesis 6f was partially supported. There was a significant indirect effect of the organization facet on mental health through the comprehensibility factor of work-SOC (95% CI= .02 to .14).

## **Cluster and Discriminant Function Analyses**

Hypothesis 7 posited that employees who perceive a positive climate in all three facets of health climate would experience more positive health and workplace outcomes than employees who perceive one or more of these facets to be not as strong. In order to test this hypothesis a k-means cluster analysis and discriminant function analysis were run. First, a k-means cluster analysis was run with the workgroup facet, supervisor facet and organization facet as the three variables being clustered on. This analysis empirically determines groups that are maximally similar within-group while simultaneously being maximally dissimilar between groups. A 6-cluster solution was retained after examining 2- through 7-cluster solutions. A 6-cluster solution was determined based on adequate cluster size and maximizing meaningful differences between clusters.

Figure 3 shows the 6-cluster solution. As shown in Figure 3, there is one cluster (Positives) that is high in all three of the facets, and one cluster (Negatives) that is low in all three of the facets. The 'High-Group/Sup' cluster is high in both the workgroup and supervisor facets yet lower in the organization facet. 'High-Group/Sup' can serve as a nice comparison point to the 'Low-Org/Sup' cluster, which is relatively high in the group facet but low in both the supervisor and organization facets. Lastly, the 'Average: Higher in group' cluster and the 'Average' cluster are similar in that they are both average in the supervisor and organization facets, but 'Average: Higher in group' is higher in the workgroup facet than 'Average'.

Cluster membership was saved as a variable and then used as a grouping variable in a discriminant function analysis. The purpose of discriminant function analysis in the current study was to investigate the difference among the cluster groups that were determined in the k-means cluster analysis. More specifically, the purpose was to test whether health climate facet clusters

affected employee's well-being. Seven variables related to employee well-being were entered into the discriminant function analysis: SF-12 mental, job stress, depression, disengagement (burnout), exhaustion (burnout), civility norms, and work ability. The discriminant function analysis is able to determine the linear combination of a this set of work-related well-being measures that best discriminates among the six groups of employees presented above.

One discriminant function was significant (Wilks' lambda= .685,  $p < .001$ ) and accounted for 64% of the variance among the groups. This function was defined with a positive correlation with civility norms ( $r = .89$ ), a positive correlation with work ability ( $r = .39$ ), a positive correlation with SF-12 mental ( $r = .34$ ) and negative correlations with job stress ( $r = -.34$ ), exhaustion ( $r = -.46$ ), disengagement ( $r = -.57$ ), and depression ( $r = -.43$ ). This pattern of correlations indicates that more positive scores on the function are associated with more positive work-related well-being. Group centroids are plotted in Figure 4.

Results from this analysis indicate that Hypothesis 7 was supported. Figure 4 shows that 'Positives' (the cluster that was positive in all three of the facets) is the most positive of all the clusters on the function. Similarly, 'Negatives' (the cluster that was negative in all three of the facets) is the most negative of all of the clusters on the function. A comparison of 'Average: Higher in group' and 'Average', which were similar in the supervisor and organization facets, but 'Average: Higher in group' was higher in the workgroup facet than 'Average', indicates that 'Average: Higher in group' is more positive on the function than 'Average'. Also, a comparison of 'Low-Org/Sup' and 'High-Group/Sup', which were similar in the workgroup and organization facets but Cluster 6 was higher in the supervisor facet, indicates that 'High-Group/Sup' is more positive on the function than 'Low-Org/Sup'. Figure 4 also shows that 'Average' and 'High-Group/Sup' are similar on the function despite their differences on the workgroup and supervisor

facets. Lastly, a comparison between ‘Negatives’ and ‘Low-Org/Sup’, which were similar in the supervisor and organization facets yet ‘Low-Org/Sup’ was slightly higher in the workgroup facet, shows that these two clusters were also similar on the function.

### **Study 1 Discussion**

The purpose of Study 1 was to examine physical and mental health outcomes of health climate as well as the mechanisms through which health climate might affect these outcomes in order to argue for the importance of organizations facilitating positive workplace health climates. Although many of the Study 1 hypotheses were not supported, some of the significant findings from this study still point to the important benefits of focusing on supporting healthy workplace climates.

#### **Direct Effects**

First, in the test of direct effects of the overall health climate scale on employee mental health, handgrip strength, blood pressure and body fat percentage, only a significant relationship was found with mental health. Although the Conservation of Resources theory was used as a theoretical explanation for why it was hypothesized that health climate would be directly related to employee physical health, further insight into the physical health metrics would indicate that the lack of a direct effect between climate and physical health is not a surprising finding. Given the physiological measures that were used (handgrip strength, blood pressure, and body fat percentage), these might be considered more long-term outcomes that have numerous determinants, and it might be more realistic to look at health climate as a variable that indirectly affects physical health through another medium. It is possible that other more immediate physiological health measures could be found that would be directly related to aspects of workplace climate. Mental health, on the other hand, was a significant direct outcome of health



climate, as predicted. The significance of this finding was perhaps more likely because mental health can be more immediately affected by an individual's contextual environment whereas the contextual environment would have to first affect something else about a person's behavior before causing physiological changes.

Furthermore, when breaking down health climate into its three separate facets, no direct relationships were found with any of the physical health outcomes. This finding is not unexpected in light of the discussion about the difficulty in finding direct effects with objective physiological indicators. However, an interesting finding from this model was that when health climate was broken into its three facets, only the organizational facet had a statistically significant direct relationship with employee mental health. This finding is surprising because of the direct relationship that was found between the overall health climate scale and employee mental health. This finding indicates that it is the organizational support aspect of health climate that is the driving force behind the impact of climate on mental health. In other words, the way the organization treats and supports an employee's health and well-being has a significant impact on that person's mental health whereas the way an individual's workgroup and supervisor treats and supports an employee's health and well-being is not having as much of a direct impact on mental health.

### **Indirect Effects**

Although there were no significant direct paths from the health climate facets to the objective physical health outcomes, as explained above, there were a few significant indirect effects. The two significant indirect effects on objective health outcomes were both from the workgroup facet through health behavior intentions impacting handgrip strength and body fat percentage. These findings suggest that although health climate does not directly and

immediately impact objective physical health outcomes, it can have an impact through another mechanism. As the workgroup facet of health climate improves (indicating more positive health norms among workgroup members), intentions for health behaviors increase. Then, as intentions for health behaviors increase, hand grip strength increases significantly and body fat percentage decreases significantly. This is an important finding because grip strength and body fat percentage are strong indicators of health in general. Therefore, an organization looking to increase employee health could do so through fostering health norms and support for health among workgroup members which should, in turn, improve their health behavior intentions and physical health.

Additionally, the workgroup facet was the only facet that significantly predicted behavior intentions in the final model even though both the workgroup and organization facet were significantly correlated to behavior intentions in initial descriptive analyses. These findings suggest that an individual's peers/coworkers play a larger role (relative to one's supervisor or organization) in determining his/her intentions to engage in a healthy behavior. This is an important finding for organizations to consider because applications of the Theory of Planned Behavior have repeatedly found the importance of behavior intentions in determining behavior, and in turn, in determining health.

Another finding that was surprising was that the organizational facet of health climate did not significantly predict behavior intentions in the final model even though the two were originally significantly correlated. This finding may suggest that the workgroup facet takes up most of the variance in health behavior intentions therefore reducing the significance of the organizational facet. However, another explanation might be that the relationship between the organizational facet and behavior intentions is really curvilinear. It is possible that some level of

organizational support for health is necessary in order for individuals to feel willing to engage in healthy behaviors, but after a certain point, as long as the minimum cutoff has been reached, additional support will not contribute much to changing one's intentions. This could also be the case with the supervisor facet. However, the significance of the workgroup facet in linearly predicting healthy behavior intentions suggests that positive increases in health norms and support for health among workgroup members does increase health behavior intentions.

Two other indirect effects that were significant were from the workgroup facet and the organizational facet through the comprehensibility factor of work-SOC on mental health. As scores for the workgroup facet of health climate become more positive, comprehensibility increases, and as comprehensibility increases, mental health increases. Similarly, as scores on the organization facet become more positive, comprehensibility increases, and as comprehensibility increases, mental health also increases. The supervisor facet of health climate did not significantly predict any of the factors of work-SOC, including comprehensibility. The organization facet, on the other hand, was significantly positively related to all three factors of work-SOC, however, only comprehensibility was significantly related to mental health.

A lack of significance in the role of the supervisor facet in predicting behavior intentions, comprehensibility, manageability or meaningfulness is also an interesting and unexpected result in this study. Table 3 shows that there was no initial significant raw correlation between behavior intentions and the supervisor facet. This suggests that health support from one's supervisor has no significant impact on whether or not that individual intends to engage in healthy behaviors. This finding isn't unexpected as one's supervisor is generally farther removed than one's peers, meaning that they would have less influence on one's behavior, and while the organization might be the farthest removed, the organization has the ability to provide the most instrumental support

for an individual to be able to engage in healthy behaviors. However, Table 3 also shows that there were significant raw correlations between the supervisor facet of health climate and comprehensibility, manageability, and meaningfulness. The significance in the initial correlations but lack of significance in the larger model suggest that the supervisor facet is being overshadowed by the workgroup and organization facets in the overall model. In other words, the workgroup and organization facets are taking up most of the variance and therefore the supervisor facet is no longer significantly contributing. This is an important point to note because the facets do not exist in isolation and therefore it is important to assess how they function in relation to each other. This finding brings up the question of whether the supervisor facet can compensate for less positive scores in either the workgroup or organization facets. This finding also brings up the question of whether other mediators are more relevant for the supervisor facet.

### **Cluster Analyses**

Findings from the k-means cluster analysis suggest that health climate differs for groups of employees, such as being high in the organization facet of health climate and low in the workgroup and supervisor facets. The discriminant function analysis used in Study 1 to distinguish differences between the 6 clusters based on the three facets of health climate on work-related well-being variables. Results indicate that the group that was high in all three of the facets had a much higher score on the function than the other clusters, and the cluster that was low in all of the three facets had the lowest score on the function. In comparing all of the clusters in between, some interesting findings emerged. First, a comparison of ‘Positives’ which was high in all of the facets to ‘High-Group/Sup’ which was equally as high in the workgroup and supervisor facets as ‘Positives’ but lower in the organization facet indicates that ‘High-Group/Sup’ scored much lower on the function. This finding suggest the strong importance of

the organization facet as this was the only major difference between the two clusters yet the work-well-being outcomes were much more negative for Cluster 6 which was only slightly lacking in the organization facet.

Next, a comparison between ‘Average: Higher in Group’ and ‘Average’ which were nearly the same in the supervisor and organization facets while ‘Average: Higher in Group’ was slightly higher in the workgroup facet, indicated that ‘Average: Higher in Group’ is significantly more positive on the function than ‘Average’. These results suggest the importance of the workgroup facet as this was the only major difference between the two clusters. A comparison between ‘High Group/Sup’ and ‘Low Org/Sup’ which are similar in the workgroup and organization facet yet ‘High Group/Sup’ is higher in the supervisor facet than ‘Low Org/Sup’, indicates that while ‘High Group/Sup’ is more positive on the function the difference is not very large. This result may suggest that the supervisor facet plays less of a role in work-related well-being than the workgroup and organization facets.

Altogether, results from the structural equation analyses as well as the cluster and discriminant function analyses suggest that health climate does impact employee health and well-being. Although the structural equation model found significance only through indirect effects, this still speaks to the importance of cultivating health climate as a component of a healthy workplace because it indirectly influences employee health. Also, even though this model did not find the supervisor facet to play a significant role in employee health outcomes, discriminant function analyses showed that individuals that were high in all three facets were significantly better off on work-related well-being variables than the other clusters, including the cluster of individuals that was only lacking in the supervisor facet. This might suggest that the supervisor

facet is related to other work-related outcomes not examined in the final structural equation model or that it is mediated by variables other than intentions for health behaviors or work-SOC.

## **Limitations**

Although the strength of Study 1 rests in the fact that it uses objective physical health data as outcomes of workplace health climate, there are a few limitations of this study that could be built upon in future research. The markers used in the current study, body fat percentage and handgrip strength in particular, might take a longer time to develop. Other more immediate physiological indicators such as cortisol levels might be useful to study in relation to workplace health climate and mediators. Another limitation of the current study is that climate is measured at an individual-level. Although many research studies examine climate at the individual-level and this has been shown to provide much information important relationships with climate variables, climate is inherently conceptualized as a shared experience and therefore it is worthwhile to also examine at aggregate levels. Study 2 addresses this shortcoming by examining health climate at the group-level and its impact on important organizational and health-related outcomes.

## **Study 2**

When studying organizations and the people within them, it is necessary to examine the multiple levels that exist in an organization in order to fully understand the relationships that are occurring within it. Although the levels that exist may differ from organization to organization, generally speaking, organizations are not flat- meaning that some sense of hierarchy does exist. Multi-level theories in organizational behavior can consist of any combination of individuals, dyads, teams, businesses, corporations and industries (Klein, Tosi, & Cannella, 1999). The importance of examining organizations from a multi-level perspective is that individual

perceptions, actions, attitudes and behaviors at the workplace do not exist in a vacuum, and to ignore the social context in which they occur would result in missing potentially important influences that exist within the work system.

The focus of Study 1 centered around individual perceptions of health in the workplace, but in Study 2 health climate is viewed from a shared perceptions perspective. Given the relatively recent development of the MOHCA scale to measure organizational health climate, empirical research on group-level health climate using this scale has not yet been conducted. Therefore, the current study seeks to answer some general as well as specific research questions about organizational health climate at multiple levels. The two questions that the current study seeks to address are as follows: (1) whether health climate exists at a group-level and facility-level, and (2) are there important outcomes associated with group-level health climate and facility-level health climate.

Similar to how it was applied in Study 1, the underlying framework of social-ecological systems can be directly applied in Study 2 when considering the influence of the work system on health climate. The social-ecological perspective assumes multiple-levels of influence and this can be examined in terms of multiple levels within the organization and/or even outside of the organization. One of the benefits of multi-level organizational research is that it allows for a complete and more accurate picture of influences in the organizational domain. Multi-level perspectives allow for the analysis of the organizational context and how that relates to the perceptions and actions of individuals (Klein et al., 1999). The social-ecological systems perspective posits that multiple levels are simultaneously interacting with an individual or workgroup, their behavior, perceptions and other variables of interest. Therefore, to examine one horizontal slice of this multi-level structure can be useful to answer certain questions but it will

never paint the entire picture. This line of thinking is particularly relevant in the realm of organizational climate.

### **Multi-Level Theory and Organizational Climate**

As mentioned previously, organizational climate has been defined as the shared perceptions that people have of their work settings that can be based on actual or inferred events as well as practices and procedures that occur in the workplace (Reichers & Schneider, 1990; Rentsh, 1990). When talking about shared perceptions this suggests analysis should be at the group-level or above rather than at the individual level. At the individual level, as examined in Study 1, climate is defined slightly differently in that it is a summary perception by individuals of the work environment that is descriptive in nature (Gavin & Howe, 1975; James & Jones, 1974). In the research literature this distinction has been referred to as psychological (individual) versus organizational (collective) climate (Ostroff, Kinicki & Tamkins, 2003). This differentiates between measures that represent individual perceptions as opposed to measures that are aggregated to represent the perceptions of a workgroup, a team or the organization.

The discussion in the research literature about individual versus collective climate can also be referred to as the “units of theory problem” (Glick, 1985). This research dilemma encourages researchers to determine the unit of theory of interest in their study. If individual perceptions are of interest, then individual-level psychological climate is appropriate. When organizational attributes are of interest, organizational climate should be used. In addition to the individual and organizational levels, some have argued for the importance of a “subunit” climate which focuses not on the entire organization but a workgroup or department level (Powell & Butterfield, 1978). In Study 2, the focus is on both the workgroup level and the organizational level (referred to in the current sample as the facility level) of health climate as opposed to the



individual level. First, as part of the effort to determine whether health climate exists at the group and/or facility level, it is important to first consider the definition, conceptual development and measurement of organizational health climate.

### **Aggregate Group-level Health Climate**

Organizational health climate has been defined as “employee perceptions of active support from upper management as well as supervisors and coworkers for the physical and psychological well-being of employees (Zweber, et al., under review). Its definition comes out of the organizational climate literature which conceptualizes climate at both the individual and collective level. It is hypothesized that the meaning of health climate will be similar at multiple levels as it is a perception of the support for health from one’s workgroup, supervisor and organization. Although at the individual level these are one’s own perception, at the group-level this would theoretically be similar except that it would consist of shared perceptions that create a health context in the workgroup. At an even higher level, it is assumed that these shared perceptions can occur across multiple workgroups within an organization or department.

This line of thinking that health climate means similar things at different organizational levels justifies the aggregation of this variable to different organizational levels in order to examine its effects (Kath, Scott, Roesch, & Ehrnhart, 2013). This is in line with the recommendation from multi-level researchers that at an early stage of investigating a construct across levels, assumptions can be made about isomorphism of the construct content and meaning in order to make meaningful comparisons (Chen, Mathieu & Bliese, 2004). In other words, it is useful to conceptualize health climate in a similar way at higher levels in order to further develop the construct and its meaning. In fact, although organizational health climate is a new and less

studied construct, workplace climate has already been examined at multiple levels and found to be quasi-isomorphic (Glick, 1985). This leads to the next hypotheses:

**H8a:** Organizational health climate and its three facets exist at the workgroup level.

**H8b:** Organizational health climate and its three facets exist at the facility level.

### **The Impact of Group-level Health Climate**

In addition to establishing that organizational health climate and the three facets of health climate actually exist and can be examined at multiple-levels, it is also important to answer the question of why should organizational leaders care about the shared perceptions surrounding health climate in their organization. To answer this question, the outcomes associated with health climate must be explored. Study 1 theorized and tested relationships between the three facets of health climate and health. Study 2 seeks to both replicate and extend these findings by associating multiple levels of the health climate facets with employee mental health as well as additional important organizational outcomes. From a social-ecological systems perspective, the workgroup, supervisor and organization facets are expected to have an influence at the individual level, and shared perceptions at the workgroup and facility levels should also be influential.

### **Mental Health**

In order to extend the findings in Study 1, the relationship between group-level health climate and employee mental health can be examined. However, to examine this relationship from a multi-level perspective rather than only the individual level requires utilizing a theory that is applicable to this multi-level conceptualization. The need to develop theories for how individual and group-level factors jointly affect health has been a great challenge in the study of the multiple levels of influence on individual health (Diez-Roux, 2000). In thinking about theories for multi-level analysis, it is important to consider that the level of theory means the

focal level that theory-based generalizations are meant to apply to (Hitt, Beamish, Jackson, & Mathieu, 2007). In the current study, the interest is in examining a cross-level model in which group and facility-level health climate are predicted to influence individual-level outcomes.

As hypothesized in Study 1, the Conservation of Resources (COR) theory can explain the hypothesized relationship between organizational health climate and employee mental health. At the group-level, this theory would suggest that groups have some perception of the available resources for health and well-being that they have, and the group could also experience actual or threatened loss of these resources. According to COR, stress will occur not only through loss or threatened loss of resources but also when resources are believed to be unstable, or where groups do not believe they can protect their resources through their joint efforts (Hobfoll, 2001). Viewing stress as a state of poor mental health, and/or as contributing to poor mental health status, organizational resources for health should positively impact employee mental health because it will reduce the likelihood that a group would feel threatened or lost resources.

Therefore, the next set of hypotheses states:

**H9a:** At the group-level the workgroup facet of health climate will significantly predict employee burnout and stress.

**H9b:** At the facility-level the workgroup facet of health climate will significantly predict employee burnout and stress.

**H9c:** At the group level the supervisor facet of health climate will significantly predict employee burnout and stress.

**H9d:** At the facility-level the supervisor facet of health climate will significantly predict employee burnout and stress.

**H9e:** At the group-level the organization facet of health climate will significantly predict employee burnout and stress.

**H9f:** At the facility-level the organization facet of health climate will significantly predict employee burnout and stress.

### **Work-related Outcomes**

In addition to replicating and extending the findings from Study 1 that organizational health climate is related to aspects of employee health, including mental health, Study 2 will also examine other outcomes in order to further answer the question of why health climate should matter to organizations. Social Exchange Theory can be used as one theoretical explanation for the relationship between organizational health climate and work-related well-being outcomes (Zweber et al., under review). The social exchange theory framework (Blau, 1964) suggests that if an employee perceives a quality relationship between the organization and its employees in terms of the organization valuing the employee's well-being, then this employee is more likely to behave in ways that benefit his/her organization. In the context of organizational health climate, if a climate is such that it provides a means for the organization to communicate to individuals a level of caring by the organization about the employee's health, then this should lead to the individual in return caring about the organization and their work, as would be exemplified by improved performance, employee engagement and organizational citizenship behaviors.

Although Social Exchange Theory provides a broad view of why organizational health climate should impact workplace outcomes, control theory in human factors can provide insight into the basis for this relationship. From a human factors design perspective, the workplace, including the individuals as well as machines and environmental factors within this workplace, are understood to be a collection of closed-loop systems (Smith, 1979). Systems control occurs

when the components of the system can interact bidirectionally and continuously (Smith, 1979). In other words, the actions or activities of one component of a workplace system are perceived/sensed by other components, which also generate activities that are then fed back to the first component. These components of the work system can include, but are not limited to, workgroups, businesses, supervisors, and individual employees, and also include technology. Therefore, control theory suggests that when the organization sets goals and takes action for employee health, the employees react to this in various ways, which is then sensed by the organization and is used to determine subsequent goals and actions. In the case of a workplace with strong positive organizational health climate this should mean that the organization and supervisors actively track the feedback from employees about employee health and the use of resources for health in order to become proactive about meeting the health needs of their employees.

These principles of Social Exchange Theory and control theory/cybernetics can also be applied in a multi-level way. It is assumed that the social-exchange model can still be applied as a theoretical explanation for the hypothesized relationships, especially given the interest in individual-level outcomes. However, the way in which the social exchange model functions might be explained differently as the group referent becomes essential in this multi-level exchange relationship. At multiple levels, this theory would suggest that groups who are experiencing support for health among their workgroup members, supervisors and the organization will reciprocate by acting in a way to benefit both the workgroup and the organization. Similarly, human factors principles can be applied to this multi-level relationship by considering cybernetic principles. Cybernetics theory has been applied to and adapted to organizational stress theories that are relevant to the current model (Edwards, 1992). This theory

details the interaction between individuals and their environment and the multiple feedback loops that occur within the work system to influence individual behaviors and perceptions (Edwards, 1992). From a multi-level perspective this would suggest that influence and continuous interaction can occur at the group and organizational level. Or in other words, group perceptions and actions can be influenced by the physical work environment, actions of organizational leaders, the social environment, and so on, and that these group perceptions will in turn dynamically impact individuals' perceptions, behaviors, actions and well-being.

Applying these theories to the potential work-related outcomes of organizational health climate, one convincing argument for the importance of health climate is related to individual performance. If a positive relationship between organizational health climate and employee health exists, it is assumed that health climate will impact job performance. Previous research on the impact of stress, an aspect of health, on performance has found some evidence for this relationship (Newman & Beehr, 1979). Although this may suggest an indirect relationship between health climate and performance, a direct relationship between group-level health climate and performance is predicted here because of the importance of context in determining individual performance. Many researchers have argued for and investigated the relationship between organizational climate and performance. For example, Al-rahimi (1990) concluded that it was important to create a work environment in which employees are able to develop to their fullest potential. Applying this thinking to organizational health climate, if an individual or group's health was not supported by the organization, they would likely not be able to perform to their fullest because they might have to worry about their health. Similarly, Barnard (1997) argued that employee's decisions such as productivity and intentions to quit are influenced by the work climate. The importance of the context in which work occurs is highlighted because

workplace climate can help to understand the processes that influence employees' behavior and work outcomes (Suliman & Abdulla, 2005). However, some studies have examined multiple aspects of workplace climate and found that some aspects influence employee performance while others do not (Patterson, Warr, & West, 2004), and therefore it is important to explore whether the specific type of climate, organizational health climate, is related to employee performance.

Similar to the relationship between organizational health climate and job performance is the possibility that health climate and its facets would predict individual work engagement. Work engagement is defined as a type of psychological presence that involves the critical components of attention and absorption (Rothbard, 2001). Work engagement has been said to be something that is “a persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behavior” (Schaufeli, Salanova, Gonzalez-Ramona, & Baker, 2002, p .74). Given that engagement is not seen to be tied to any one particular event, it is reasonable to assume that engagement could be greatly influenced by a persistent organizational context. In other words, the climate of an organization or workgroup could have a strong influence on employee engagement. This proposition could be justified, as many of the previous relationships were, using the social exchange theory as well as control theory and principles of human factors. If employees perceive a climate of support in their organization, they might react by becoming absorbed in their work in order to benefit the organization. Past research has found support for the significant relationship between perceived organizational support, and job and organizational engagement (Saks, 2006). As a more specific type of support and context within which employees should feel more cared for by the organization, their supervisors, and their workgroup members, Study 2 seeks to empirically test the relationship between these three facets of MOHCA at the group-level and individual engagement.

In addition to performance and engagement, another important outcome that may be associated with organizational health climate and its three facets is organizational citizenship behaviors (OCB). The social exchange relationship has often been applied to OCB as an outcome of organizational justice suggesting that employees reciprocate the fair treatment offered by their organization (Organ, 1988, 1990). Some research has also determined a link between perceived organizational support and different forms of organizational citizenship behaviors (Eisenberger, Fasolo, & Davis-LaMastro, 1990; Shore & Wayne, 1993; Wayne, Shore & Liden, 1997). This relationship is thought to exist because of perceived organizational support consisting of a general perception that the organization values the employee (Moorman, Blakely, & Niehoff, 1998). Again, extending this line of thinking to a more specific type of support and the valuing of the employees health and well-being that will then be reciprocated by caring for others and the organization through OCB, organizational health climate and its facets should be related to OCB. Further, viewing health climate facets as shared perceptions creates a context in which this social exchange relationship should exist, and therefore this relationship is expected from a multi-level perspective.

Taken all together, the social exchange relationship and the associated control dynamics that could also suggest that in addition to employee health, group and facility-level health climate and its three facets are likely to have an impact on individual job performance, individual engagement, and OCBs.

**H10a:** At the group-level, the workgroup facet of health climate will significantly predict individual performance, engagement and OCBs.

**H10b:** At the facility-level, the workgroup facet of health climate will significantly predict individual performance, engagement and OCBs.



**H10c:** At the group level, the supervisor facet of health climate will significantly predict individual performance, engagement and OCBs.

**H10d:** At the facility-level, the supervisor facet of health climate will significantly predict individual performance, engagement and OCBs.

**H10e:** At the group-level, the organization facet of health climate will significantly predict individual performance, engagement and OCBs.

**H10f:** At the facility-level, the organization facet of health climate will significantly predict individual performance, engagement and OCBs.

### **Importance of the Three Group-level Facets**

In addition to the importance and existence of organizational health climate facets at the group and facility level, it is also important to answer the question of whether all three facets of health climate at the group-level are necessary for experiencing the full benefits of a healthy organization. The social ecological perspective posits that multiple levels of influence on health occur simultaneously, suggesting that all three of the health climate facets would be important in employee outcomes. This perspective emphasizes the importance of context (Salazar & Beaton, 2000), which is particularly relevant when examining the health climate facets from an aggregate group-level. However, the ecological perspective offers no predictions for how certain levels of influence might work together to determine outcomes. In other words, what happens when certain aspects are lacking while there is strength in one or more of the others is unclear.

Therefore, the current study aims to test this question empirically by examining a comparison among groups that are classified as having differing levels of the three facets of health climate. Specifically, the interest is in comparing groups that are similar in certain facets but differ in one or more of the remaining facets. Examining differences among these types of

groups on a set of work and health-related outcomes will allow for conclusions to be drawn on whether all three facets of health climate at the group-level are necessary for experiencing the positive effects of a healthy workplace climate, and also what the effect on outcomes is if one or more of the facets is lacking.

Further, although there are theoretical grounds for the benefits provided by each facet, it is not expected that these benefits will be mutually exclusive and therefore more simple additive effects are not expected. Rather, an interaction among group-level facets is likely. An interaction would suggest that the effect of being positive in one facet differs depending on the level of the other facets. For example, while the group-level workgroup facet of health climate should lead to positive health and work-related outcomes, the magnitude of this effect likely differs depending on the other contexts that are simultaneously present, in this case, depending on the group-level supervisor and organization facets. Therefore the next set of hypotheses state:

**H11:** Workgroups with a positive climate in all three facets of health climate will experience more positive health and workplace outcomes than workgroups that are not as strong in one or more of these facets.

**H12:** The three group-level facets of MOHCA will interact to predict employee mental health and workplace outcomes.

## **Method**

### **Participants and Procedure**

A dataset collected as part of an on-going multi-year study, referred to as the Civility Among Healthcare Professionals (CAHP) project, on correctional healthcare workers was used to test the Study 2 hypotheses. These healthcare workers are primarily medical, dental and mental health professionals. The central purpose of the CAHP project is to improve the social

work environment by implementing a workplace incivility training to all employees. The CAHP project involved several waves of data collection, some of which are still ongoing or upcoming. First, a major baseline survey was conducted before any of the incivility trainings took place. The baseline survey assessed workplace attitudes, beliefs, and behaviors in addition to individual characteristics as well as social network data in order to assess with whom employees frequently interacted with while at work. The social network data as well as qualitative feedback from site visits, organizations charts and focus groups, were used to justify the creation of workgroups based largely on facility, shift and discipline.

The current study uses data from the third wave of data collection which occurred after all facilities received the incivility training. This data collection consisted of an online survey that assessed many workplace attitudes, beliefs and behaviors in addition to the variables used in this study. Information was also gathered about facility, shift and discipline in order to differentiate workgroups. 228 out of approximately 800 employees (28.5% response rate) responded to the survey.

The final sample used for hypothesis testing included 171 participants nested within 42 work groups within 12 facilities. ( $M_{\text{group size}}=5.4$ ,  $SD=3.05$ ). Participants were excluded from this sample if they did not complete one or more of the constructs used in the Study 2 hypotheses, or if they were not identified within a workgroup consisting of two or more employees. Participants were also removed if there was only one workgroup within a facility. The sample was 72% female, which is consistent with the large proportion of female healthcare workers. The largest age group of the sample was age 52-60 (30% of sample), 82% of the survey respondents were Caucasian, and 76% had a college degree or higher. Average job tenure was 9 years.

## Measures

Details on the measures used for Study 2 are presented below. Reliability estimates based on individual-level data are also reported below for all measures. Additionally, internal consistency estimates based on work-group level data are reported for health climate and the three facets because these constructs were conceptualized at both the individual and workgroup-level. Internal consistency estimates for all variables can be found in Table 6. All scales presented below were measured on a seven-point Likert scale ranging from “1” (strongly disagree) to “7” (strongly agree) unless otherwise noted.

**Health Climate.** MOHCA will be used to measure the three facets of organizational health climate as cited in Study 1.

**Burnout.** Burnout was measured using 4 items from the Oldenburg Burnout Inventory (Demerouti, Bakker, Nachreiner, & Schaufeli, 2000). An example item from this scale is “After work, I usually have enough time for leisure activities.” Items were reverse scored for these analysis so that higher scores indicate higher levels of burnout. A previous reliability estimate of this scale was .67.

**Stress in General/Job Stress.** Job stress was measured using the 6-item Stress in General/Job Stress measure (Stanton, Balzer, Smith, Parra, & Ironson, 2001). An example item from this scale is “In general, I think my job is pressured.” A previous reliability estimate of this scale was .82.

**Performance.** Individual self-reported job performance was measured using four items adapted from a scale by Farh and colleagues (1991). Employees were asked the stem “How do you feel your performance is viewed by the SUPERVISOR... What does your supervisor (i.e., not you)

think of...” and an example item is “...the quality of your work?” A previous alpha for this scale was .92.

**Organizational Citizenship Behaviors.** OCBs were measured using two items from and interpersonal OCBs scale (Williams & Anderson, 1991). An example item from this scale is “I pass along work-related information to others.” A previous alpha for this scale was found to be .77.

**Engagement.** Engagement was measured using 10 items from the Individual Work Engagement Scale (Schaufeli, Bakker, & Salanova, 2006). An example item from this scale is “I am immersed in my work,” and a previous alpha for this scale is .93.

### **Analysis Strategy**

Hierarchical Linear Modeling (HLM) was used to test the multi-level hypothesized models. Using this approach the facets were entered into different models to examine them separately. First, null models were tested on each of the outcome variables in order to parcel the variances. Then models were built in that they were first run with level-1 predictors only, then level-1 and level-2 predictors, and then all three levels of predictors. Model deviance was compared using the chi square test in order to determine if adding predictors to the models was statistically warranted.

Mean data aggregation techniques were used in order to create second and third-level composites of the facets of health climate. However, variance composites were also used and entered into the models at each respective level given the meaningfulness of climate strength and its potential relevance to workplace outcomes. Therefore both data aggregation techniques were used in the current study as has been done in previous workplace climate research (Roberson,

Sturman, & Simons, 2007). Including the standard deviation aggregates in the models is essentially controlling for climate strength when interpreting the other results.

All variables at all levels of analysis were entered into the models using a grand mean centering approach. This was done for ease of interpretability of the results.

## **Results**

### **Descriptive Statistics**

Descriptive statistics including mean, standard deviation, minimum, maximum, number of items and coefficient alpha for all of the variables used in Study 2 are presented in Table 6. All scales at the individual-level were created using the mean of the items in each measure. As described in the analysis strategy section, at the group and facility-levels these variables were created using both mean aggregation and standard deviation aggregation techniques. A correlation table which includes all individual-level variables as well as the outcomes examined in Study 2 can be seen in Table 7. The correlations between group and facility-level variables and the individual outcomes can be seen in Table 8. Results from this correlation table suggest that the supervisor and organization facets of health climate were not statistically different from each other ( $r=.89$ ), and therefore these two facets were examined together as one scale and will be referred to as the supervisor/organization facet in the study outcomes. Other zero-order correlations among the variables in Study 2 were in the expected direction and indicated that the constructs were not overlapping.

The descriptive statistics show that, overall, there were high levels of organizational citizenship behaviors towards employees ( $M= 6.10$ ). These statistics also suggest that there were relatively high levels of individual employee engagement ( $M= 5.10$ ). The descriptive statistics also show that the mean level of the individual perceptions of the workgroup facet of health

climate was relatively high on a 7-point scale ( $M=4.71$ ) and the mean level of the individual perceptions of the supervisor/organization facet of health climate was relatively average on a 7-point scale. ( $M=3.65$ ). All other variables in Study 2 had means that were approximately midpoints on their respective scales.

### **Data Aggregation**

Hypothesis 8a and Hypothesis 8b state that organizational health climate and its facets exist at the workgroup and facility levels respectively. To justify aggregation to the group and facility levels, agreement among workgroup members ( $r_{wg(J)}$ ) and variability between groups (ICC(1)) was examined (LeBreton & Senter, 2008). Table 9 presents these statistics for the workgroup facet and the supervisor/organization facet of health climate. In order to determine whether there is significant variability between groups, one-way analyses of variance (ANOVAs) were run with individual scores on the facets as the dependent variable and the workgroup as the independent variable. Additionally, in order to determine if there is significant variability between facilities, one-way analyses of variance (ANOVAs) were run with individual scores on the facets as the dependent variable and the facility as the independent variable. The ANOVA results for the workgroup facet indicate that there is significant variability between groups and the ICC(1) is .11, which justifies aggregation to the group level. Additionally, the  $r_{wg(J)}$  was calculated to justify aggregation. Some standards for  $r_{wg(J)}$  have suggested that values greater than or equal to .71 indicate strong within-group agreement. While the results indicate that the workgroup facet mean  $r_{wg(J)}$  is below this cutoff at .61, the significant and non-zero ICC(1) indicates it is worthwhile to examine this construct at a workgroup level. Although the ANOVA for the workgroup facet at the facility level was not statistically significant, the ICC(1) was calculated to be .06, which justifies examining this in a multi-level framework.

When examining the supervisor/organization facet, the ANOVA at the workgroup level was not statistically significant. However, the ICC(1) was calculated to be .07 which indicates that seven percent of the variance lies between groups, and therefore it is warranted to include the supervisor/organization facet in a multi-level analysis. Additionally, the supervisor/organization facet mean  $r_{wg(J)}$  is above the standard cutoff at .74 indicating that there is significant within-group agreement, also justifying the examination of this construct at the workgroup-level. At the facility level, the ANOVA for the supervisor/organization facet was also not significant. However, the ICC(1) for this facet at the facility level was found to be .16 which justifies the examination of this facet at the group-level because this indicates that 16% of the variance lies between facilities.

In addition to examining the ICC values for the group-level constructs of interest, the ICCs were also calculated for the outcome variables of interest in the study for the purpose of partitioning the variance. Before level-1 and level-2 predictors were entered into any of the proposed models, null models were run in which the only thing that was entered was the outcome variable in order to partition variance. This was done to determine the percent of between-group variability in each criterion variable. There were five criterion variables in Study 2: stress, burnout, organizational citizenship behaviors, employee engagement, and performance. A null model with stress as an outcome indicates that the  $ICC = .17$  ( $\tau_{00} = .10$ ,  $\sigma^2 = .76$ ) indicating that 17% of the variance in stress lies between groups. With the outcome of burnout in the null model, the ICC was calculated to be .02 ( $\tau_{00} = .03$ ,  $\sigma^2 = 1.69$ ). Although this is a low value for an ICC, this still indicates that 2% of the variance in employee burnout is the result of the work group to which individuals belong.



A null model with performance as an outcome indicates that the  $ICC = .20$  ( $\tau_{00} = .09$ ,  $\sigma^2 = .36$ ) meaning that 20% of the variance in employee performance lies between groups. A null model with organizational citizenship behaviors as an outcome indicates that the  $ICC = .08$  ( $\tau_{00} = .07$ ,  $\sigma^2 = .83$ ). Again, while this is a relatively low ICC value, it still indicates that 8% of the variance in organizational citizenship behaviors is the result of the work group that individuals belong to. Lastly, a null model with employee engagement as an outcome indicates that the  $ICC = .01$  ( $\tau_{00} = .02$ ,  $\sigma^2 = 1.57$ ) which indicates that only 1% of the variance in individual employee engagement lies between work groups.

### **Power Analysis**

Optimal Design v2.01 (Raudenbush, 1997; Raudenbush & Liu, 2000) was used to conduct a power analysis for Study 2. The purpose of the power analysis was to determine the level of power to detect the hypothesized cross-level effects based on the  $ICC(1)$  values and effect size. Power analyses were run for both 3-level and 2-level designs because the interest was in determining whether there would be enough power to detect level-2 effects as well as enough power to detect level-3 effects. Separate power analyses were done for level-2 versus level-3 effects also because it was assumed that if the addition of level-3 predictors did not significantly improve model fit, then a 2-level model would be used for final interpretation.

For the level-3 power analysis, alpha is fixed at  $\alpha = .05$ , the average cluster size (average workgroups within a facility) is fixed at 4 and the effect size is presented at values of .20, .50, and .80. Effect sizes of these magnitudes were examined because they correspond with small, medium and large effects (Cohen, 1988). Results from the level-3 power analysis are presented in Figure 5. In this figure, the number of clusters is on the x-axis, however the number of clusters

is fixed at 12 as this is the number of facilities examined in the analyses. These results suggest that the power to detect a small effect across the range of ICC values will be approximately .70.

For the level-2 power analysis, alpha is also fixed at  $\alpha = .05$ , the average cluster size (average number of individuals within a workgroup) is fixed at 4 and the effect size is presented at values of .20, .50, and .80. Results from the level-2 power analysis are presented in Figure 6. In this figure, the number of clusters is presented on the x-axis, although this number is fixed at 42 because that is the number of workgroups retained in this analysis. These results suggest that the power to detect medium or large effects across the range of ICC values will be at least .70.

### **Cross-level Effects**

Due to the multi-level nature of the data in Study 2, hierarchical linear modeling (HLM) was used to test the cross-level relationships hypothesized in this study. The program used for study analyses was HLM v6.06 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004). Full maximum likelihood estimation was specified as the estimation method for the all study analyses so that the deviance statistics from nested models could be compared to determine significant fit of nested models (Raudenbush & Bryk, 2002). Critical values for chi square at degrees of freedom equal to the difference in parameters estimated in the two models being compared can be used to determine whether a nested model with more parameters estimated fits significantly better than a more parsimonious model (Raudenbush & Bryk, 2002). Additionally, random intercepts were specified in all of the models tested, however slopes were not allowed to randomly vary across groups.

**Workgroup Facet.** Hypothesis 9a stated that at the group-level, the workgroup facet of health climate would be significantly related to employee burnout and stress. Hypothesis 9b similarly stated that at the facility-level the workgroup facet of health climate will significantly

predict employee burnout and stress. In order to test these two hypotheses, first a model was run in which burnout was the outcome and the workgroup facet of health climate was entered as a level-1 predictor and the mean and standard deviation aggregates of the workgroup facet were entered as level-2 predictors. Additionally in this model, the facility-level mean and standard deviation aggregates were entered as level-3 predictors of individual burnout. This model fit significantly better than the null model which had burnout as an outcome and no predictors  $\Delta\chi^2(5)=25.52, p<.01$ . However, the 3-level model did not fit better than the 2-level model  $\Delta\chi^2(2)=0.81, NS$ , and therefore the burnout portion of Hypothesis 9b was not supported. The 2-level model also did not fit significantly better than the 1-level model  $\Delta\chi^2(2)=1.65, NS$ , and therefore the single-level model was retained and interpreted and this part of Hypothesis 9a was not supported. Results from this analysis can be seen in Table 10. However, although group and facility-level effects were not found, at the individual-level the workgroup facet of health climate was significantly related to individual employee burnout ( $\beta=-.29, p<.01$ ). This finding suggests that as individual perceptions of the workgroup facet of health climate increase, their individual burnout decreases.

Next, a model was run in which individual job stress was the outcome and the workgroup facet of health climate was entered as a level-1 predictor, and the mean and standard deviation aggregates of the workgroup facet were entered as level-2 predictors. Additionally in this model, the facility-level mean and standard deviation aggregates were entered as level-3 predictors of individual job stress. This 3-level model fit the data significantly better than the null model which had stress as an outcome and no predictors in the model  $\Delta\chi^2(5)=18.31, p<.01$ . Similar to models with burnout as the outcome, the 3-level model did not fit the data better than the 2-level model  $\Delta\chi^2(2)=.03, NS$  and therefore no support was found for Hypothesis 9b. However, the 2-

level model was retained and interpreted. Results from this model can be seen in Table 10. Results from this model indicate that at the group-level both the mean aggregated workgroup facet ( $\beta = -.26, p < .05$ ) and the standard deviation aggregated workgroup facet ( $\beta = -.44, p < .01$ ) were significantly related to individual job stress. Thus Hypothesis 9a was supported in that at the group-level, as perceptions of the workgroup facet of health climate increase, individual job stress decreases. In contrast, individual-level perceptions of the workgroup facet of health climate were not significantly related job stress in this 2-level model.

Hypothesis 10a stated that at the group level the workgroup facet of health climate would be significantly related to employee performance, engagement and organizational citizenship behaviors. Similarly, Hypothesis 10b stated that at the facility-level the workgroup facet of health climate would significantly predict employee performance engagement and organizational citizenship behaviors. First, a model was run in which performance was the outcome and the workgroup facet was entered as a level-1 predictor, and the aggregate of the workgroup facet as well as the standard deviation aggregate of health climate were entered as level-2 predictors. Additionally in this model testing, the facility-level aggregate of the workgroup facet of health climate was entered as a level-3 predictor along with the facility-level aggregate of the standard deviation of the workgroup facet of health climate. This 3-level model fit significantly better than the null model which had performance as an outcome and no predictors  $\Delta\chi^2(5) = 15.28, p < .01$ . However, this model with three levels of predictors did not fit significantly better than the nested model which did not include any of the third-level predictors  $\Delta\chi^2(2) = 0.61, NS$ . Therefore, the model with only two levels of predictors was retained and interpreted. Results from this analysis can be seen in Table 10. With both the level-1 and level-2 predictors in the model, the level-1 workgroup facet of health climate was not significantly related to employee performance.

At the group-level, the aggregated standard deviation of the workgroup facet was also not significantly related to employee performance. However, the group-level workgroup facet was significantly related to employee performance ( $\beta=.23$ ,  $p<.05$ ). This indicates that more positive scores on the workgroup facet of health climate are associated with higher levels of individual self-reported performance.

Next, a model was run in which employee engagement was the outcome, the workgroup facet was entered as a level-1 predictor, and the aggregate of the workgroup facet as well as the standard deviation aggregate of health climate were entered as level-2 predictors. Additionally in this model testing, the facility-level aggregate of the workgroup facet of health climate was entered as a level-3 predictor along with the facility-level aggregate of the standard deviation of the workgroup facet of health climate. This 3-level model fit better than the null model which only had engagement as an outcome and no predictors  $\Delta\chi^2(5)=19.33$ ,  $p<.01$ . However, the 3-level model did not fit significantly better than the 2-level model  $\Delta\chi^2(2)=2.58$ , NS. The 2-level model also did not fit significantly better than the level-1 only model  $\Delta\chi^2(2)=2.54$ , NS, and therefore the single level model was retained and interpreted. Results from this model can be seen in Table 10. Although group-level and facility-level relationships were not found given that the models with these predictors did not fit better than the level-1 model, a significant relationship was found between the individual-level workgroup facet of health climate and employee engagement ( $\beta=.19$ ,  $p<.01$ ). This finding suggests that as individual perceptions of the workgroup facet of health climate increase, individual engagement increases.

Lastly, a model was run in which the measure of organizational citizenship behaviors was entered as the outcome, the workgroup facet was entered as a level-1 predictor, and the aggregate of the workgroup facet as well as the standard deviation aggregate of health climate were entered

as level-2 predictors. Additionally in this model testing, the facility-level aggregate of the workgroup facet of health climate was entered as a level-3 predictor along with the facility-level aggregate of the standard deviation of the workgroup facet of health climate. This 3-level model fit the data significantly better than the null model which had organizational citizenship behaviors as an outcome and no predictors  $\Delta\chi^2(5)=13.69, p<.05$ . However, the 3-level model did not fit the data better than the 2-level model  $\Delta\chi^2(5)=0.97, NS$  and therefore the 2-level model was retained and used for analyses. Results from this model can be seen in Table 10. In this model, only the group-level mean aggregate was significantly related to individual organizational citizenship behaviors ( $\beta=.34, p<.05$ ).

Based on the results of testing these models, Hypothesis 10a was partially supported and no support was found for Hypothesis 10b.

**Supervisor/Organization Facet.** Hypothesis 9c and Hypothesis 9e states that at the group level the supervisor and organization facets of health climate will significantly predict employee burnout and stress. Hypothesis 9d and Hypothesis 9f also state that at the facility level the supervisor and organization facets of health climate will predict employee burnout and stress. As mentioned previously, the supervisor and organization facets were highly correlated in this sample and therefore the two were analyzed together as one facet. To test these hypotheses, first a model was run in which burnout was entered as an outcome, the supervisor/organization facet was entered as a level-1 predictor, and the mean aggregate of the supervisor/organization facet as well as the standard deviation aggregate were entered as level-2 predictors. Additionally, the facility-level mean and standard deviation aggregates of the supervisor/organization facet were entered as level-3 predictors. This 3-level model fit the data significantly better than the null model  $\Delta\chi^2(5)=35.55, p<.01$ . However, the 3-level model did not fit significantly better than the

2-level model  $\Delta\chi^2(2)=1.81$ , NS. The 2-level model also did not fit better than the single-level model  $\Delta\chi^2(2)=0.10$ , NS. Therefore the single-level model was retained and interpreted. Results from this model can be seen in Table 11. Results from this model indicate that at the individual-level, the supervisor/organization facet of health climate is significantly related to individual burnout ( $\beta=-.38$ ,  $p<.01$ ). This finding suggests that as individual perceptions of the supervisor/organization facet of health climate increase, individual burnout decreases.

Next, a model was run in which job stress was entered as an outcome and the supervisor/organization facet was entered as a level-1 predictor and the mean aggregated of the supervisor/organization facet as well as the standard deviation aggregate were entered as level-2 predictors. Additionally, the facility-level mean and standard deviation aggregates of the supervisor/organization facet were entered as level-3 predictors. This 3-level model fit significantly better than the null model  $\Delta\chi^2(5)=30.96$   $p<.01$ . However, the 3-level model did not fit better than the 2-level model  $\Delta\chi^2(2)=0.03$ , NS. The 2-level model also did not fit better than the single-level model  $\Delta\chi^2(2)=1.09$ , NS, and therefore the single-level model was retained and interpreted. Results from this model can be seen in Table 11. Results from this model indicate that at the individual-level, the supervisor/organization facet of health climate is significantly related to employee job stress ( $\beta=-.25$ ,  $p<.01$ ). This finding suggests that as individual perceptions of the supervisor/organization facet of health climate increase, job stress decreases.

Thus, although the supervisor/organization facet of health climate at the individual-level was found to be significantly related to burnout and job stress, Hypothesis 9c and Hypothesis 9e which predicted group-level effects, were not supported. Additionally, Hypothesis 9d and Hypothesis 9f, which predicted facility-level effects, were also not supported.

Hypothesis 10c and Hypothesis 10e state that at the group-level the supervisor and organization facets of health climate are related to individual performance, engagement and organizational citizenship behaviors. Similarly, Hypothesis 10d and Hypothesis 10f state that at the facility-level the supervisor and organization facets of health climate are related to these three outcomes. First, a model was run in which performance was entered as the outcome and the supervisor/organization facet was entered as a level-1 predictor, and the aggregate of the supervisor/organization facet as well as the standard deviation aggregate of supervisor/organization facet were entered as level-2 predictors. Additionally, in this model testing, the facility-level aggregate of the supervisor/organization facet of health climate was entered as a level-3 predictor along with the facility-level aggregate of the standard deviation of the supervisor facet of health climate. This 3-level model fit significantly better than the null model  $\Delta\chi^2(5)=16.81, p<.01$ . However, this model did not fit significantly better than the 2-level model  $\Delta\chi^2(2)=0.44, NS$ , and therefore the 2-level model was retained for analysis. Results from this analysis can be seen in Table 11. Results from this model indicate that the group-level predictors were not significantly related to individual performance. However at the individual-level, the supervisor/organization facet was found to be significantly related to individual performance ( $\beta=.11, p<.01$ ).

Next, a model was run in which engagement was entered as an outcome, the supervisor/organization facet was entered as a level-1 predictor, and the mean and standard deviation group-level aggregates were entered as level-2 predictors. Additionally, the mean and standard deviation facility-level aggregates were entered as level-3 predictors. This 3-level model fit significantly better than the null model which only had engagement as an outcome and no predictors  $\Delta\chi^2(5)=33.17, p<.01$ . However, the 3-level model did not fit significantly better



than the 2-level model  $\Delta\chi^2(2)=2.92$ , NS. The 2-level model also did not fit significantly better than the single-level model  $\Delta\chi^2(2)=1.57$ , NS, and therefore the single-level model was retained and interpreted. Results from this model can be seen in Table 11. Results from this model indicate that at the individual level the supervisor/organization facet of health climate is significantly related to individual engagement ( $\beta=.33$ ,  $p<.01$ ). These results suggest that as individual perceptions of the supervisor/organization facet of health climate increase, individual engagement increases.

Last, a model was run in which the variable for organizational citizenship behaviors was entered as an outcome and the supervisor/organization facet was entered as a level-1 predictor, and the mean and standard deviation group-level aggregates were entered as level-2 predictors. Additionally, the mean and standard deviation facility-level aggregates were entered as level-3 predictors. This 3-level model did not fit significantly better than the null model  $\Delta\chi^2(5)=9.24$ , NS. The 2-level model did fit significantly better than the null model  $\Delta\chi^2(3)=8.12$ ,  $p<.05$ , however, it did not fit significantly better than the model with only level-1  $\Delta\chi^2(2)=0.62$ , NS, and therefore the single-level model was retained for analysis. Results from this model can be seen in Table 11. Results from this model indicate that at the individual-level the supervisor/organization facet of health climate is significantly related to organizational citizenship behaviors ( $\beta=.11$ ,  $p<.05$ ).

Results from these three models, which examine the outcomes of performance, engagement and organizational citizenship behaviors, indicate that while there are some significant relationships with individual-level perceptions of the supervisor/organization facet, there are no significant findings at the group or facility levels. Thus, Hypothesis 10c, Hypothesis 10d, Hypothesis 10e and Hypothesis 10f were not supported.

## Cluster Analysis

Hypothesis 11 posits that workgroups with a positive climate in all three facets of health climate will experience more positive health and workplace outcomes than workgroups who are not as strong in one or more of these facets. In order to test this hypothesis a k-means cluster analysis was run on the aggregated data file and then a discriminant function analysis was run after saving cluster membership on the full data file. First, a k-means cluster analysis was run with the group-level workgroup facet, supervisor facet and organization facet as the three variables being clustered on. The sample size for this analysis was 43 workgroups because workgroups were included in this analysis even if they were the only workgroup in their facility, and because one workgroup was lost due to missing data on one of the facets. This analysis empirically determines groups that are maximally similar within-group while simultaneously being maximally dissimilar between groups. First, a 6-cluster solution was examined, as this was the number of clusters determined in Study 1. However, a much lower sample size in the Study 2 k-means cluster analysis could explain why the 6-cluster solution didn't yield meaningful results. Therefore, a 4-cluster solution was retained after examining 2- through 5- cluster solutions.

The 4-cluster solution is shown in Figure 7. As shown in Figure 7, there is one cluster (Positives) that is high in all three of the health climate facets, and one cluster (Negatives) that is low in all three of the health climate facets. 'Average' and 'Average-Higher Workgroup' serve as comparison points because they have similar levels of the supervisor and organization facet of health climate but 'Average-Higher Workgroup' is higher in the workgroup facet than 'Average'. Also, 'Average-Higher Workgroup' can be compared to 'Positives' because these two clusters are similar in the workgroup facet but 'Average-Higher Workgroup' is lower in the supervisor and organization facets than 'Positives'.

Cluster membership was saved as a variable and then used in the full dataset as a grouping variable in a discriminant function analysis. Individual-level outcomes were entered into this discriminant function analysis in order to test whether health climate facet clusters affected employee well-being and work-related outcomes. The five focal outcome variables of Study 2 were entered into the discriminant function analysis: burnout, stress, performance, engagement and organizational citizenship behaviors. This discriminant function analysis was able to determine the linear combination of this set of outcomes that best discriminates among the four groups of employee workgroups presented above.

One discriminant function was significant ( Wilks' lambda= .80,  $p < .01$ ) and accounted for 67.4% of the variance among the clusters. This function was defined with a positive correlation with employee performance ( $r = .70$ ), a positive correlation with citizenship behaviors ( $r = .38$ ) and a positive correlation with individual engagement ( $r = .51$ ). This function was also defined with negative correlations with job stress ( $r = -.80$ ) and burnout ( $r = -.49$ ). This pattern of correlations indicates that more positive scores on the function are associated with more positive well-being and work-related outcomes.

Group centroids on this significant function are plotted in Figure 8. Results from this analysis indicate that Hypothesis 11 was supported. Figure 8 shows that 'Positives', which was the most positive in all three of the facets, is the most positive of all the clusters on this function. Similarly, 'Negatives', which was the lowest in all three of the facets, is the most negative of all the clusters on this function. Interestingly, 'Average' and 'Average-Higher Workgroup' do not significantly differ on this function even though 'Average-Higher Workgroup' has higher levels of the workgroup facet than 'Average'. However, 'Positives' has a significantly more positive score on the function than 'Average-Higher Workgroup' even though these two clusters have

similar scores on the workgroup facet but differ in that ‘Average-Higher Workgroup’ has lower scores on the supervisor and organization facets. These results suggest that in this sample the organization/supervisor facet is playing the biggest role in differentiating groups based on the combination of the outcomes of performance, engagement, organizational citizenship behavior, burnout and stress.

### **Interaction Among Group-level Facets**

Hypothesis 12 posits that the three group-level facets of MOHCA will interact to predict employee mental health and workplace outcomes. In order to test this hypothesis, an interaction term was created that was the group-level workgroup facet multiplied by the group-level supervisor/organization facet. This interaction term was then entered into HLM models for each outcome at level 2. Additionally, in these models, the mean aggregates of group-level workgroup facet and the group-level supervisor/organization facet were entered at level-2 and individual perceptions of the workgroup facet and the supervisor/organization facet were entered at level 1. The outcomes examined were the five focal outcomes of Study 2: burnout, job stress, performance, engagement, and organizational citizenship behaviors. Results from these analyses indicate that none of the group-level interaction terms for any of the five health and work-related outcomes were statistically significant, and therefore Hypothesis 12 was not supported. Table 12 provides the results from these five models.

After examining these models in which the interactions at the group-level were not significant, and no group-level facets were significant predictors of the five outcome variables with all of the other level-2 and level-1 variables in the model, post-hoc tests were run in SPSS to examine interactions between facets at the individual level. Results from these analyses indicate that the individual-level interaction term was not significant for the outcomes of burnout,

job stress, and individual engagement. This suggests that the effect of individual perceptions of the workgroup facet of health climate does not differ depending on the level of individual perceptions of the supervisor/organization facet. However, interaction terms were significant for the outcomes of organizational citizenship behaviors towards other employees and performance.

Figure 9 represents the interaction between the workgroup and supervisor/organization facets on organizational citizenship behavior. As shown in Figure 9, individuals who have low perceptions of the workgroup facet of health climate, tend to be low in terms of organizational citizenship behaviors towards other employees regardless of what their perceptions of the supervisor/organization facet are. However, for individuals who are high in the workgroup facet of health climate as well as high in the supervisor/organization facet, they have higher levels of organizational citizenship behaviors than individuals who are high in the workgroup facet of health climate but low in the supervisor/organization facet. Similarly, Figure 10 shows the interaction between the workgroup facet and the supervisor/organization facet on self-rated performance. As shown in Figure 10 employees who have low levels of perceptions of the workgroup facet of health climate have low levels of performance regardless of their level of the supervisor/organization facet. However, individuals with higher ratings of the workgroup facet and high ratings of the supervisor/organization facet have significantly more positive self ratings of performance than individuals with high levels of the workgroup facet and low levels of the supervisor/organization facet.

## **Study 2 Discussion**

The purpose of Study 2 was to examine health climate from a shared perceptions perspective by aggregating the facets to both the workgroup and facility levels and to determine what health and work-related outcomes might be related to the health climate facets at these

upper levels. An examination of these research questions helps add to the overarching goal of all three studies which is to find evidence for the importance of organizational health climate to organizations. Results from Study 2 suggest that organizational health climate is a construct that needs to be studied in a multi-level framework. Intra-class correlation coefficients above zero as well as relatively strong within-group agreement suggests that health climate can be a shared perception among workgroup members as well as among individuals working within the same facility.

Interestingly, in this correctional health care worker sample, preliminary descriptive statistics and subsequent exploratory factor analyses suggest that the supervisor and organization facets of health climate do not constitute different facets in this sample. For this reason, the two were combined to one facet in this sample as there was significant reliability for this as one scale. The fact that the supervisor and organization facets were not distinct in this sample is likely due to the structure of this work organization. Although these employees work within correctional facilities across a state in the Northeast, the healthcare workers are not actually employed by the state department of corrections. The organization that the health care workers are employed by is run by an outside entity, and therefore the supervisors working inside each facility might represent the organization itself to the health care workers working there more so than in a standard organization. This is important to note because it suggests that researchers and practitioners should strongly consider the structure and function of their target organization before deciding to use the MOHCA scale, and also determine what facets of analysis might be salient to that organization. In samples such as this correctional health care workers sample for example, it might have been useful to reframe some of the items to more specifically highlight which levels are being referenced by certain items.

After justifying that the health climate facets could be aggregated to the workgroup and facility levels, models were run in which these group-level and facility-level constructs were examined as predictors of job stress, burnout, performance, individual engagement and organizational citizenship towards other employees. Results indicate that neither the facility-level workgroup health climate facet nor the facility-level supervisor/organization health climate facet were significant predictors of any of these outcomes. These results were not entirely surprising given the relatively low level of power to detect effects at the third level given that the number of facilities at this level was limited to 12. Nonetheless, if there was a strong effect, there would be enough power in this analysis to detect it.

Similarly, the results suggest that only a few of the cross-level effects from the group-level facets were statistically significant. At the group-level, the mean aggregate of the workgroup facet of health climate was significantly related to individual job stress, individual performance and organizational citizenship behaviors towards other employees. These results suggest that the context for health among workgroup members as well as the perceived norms for health behaviors among these group members are both related to an individual's feelings of job stress, self-rated performance and the positive behaviors towards other employees. The two outcomes that the group-level workgroup facet of health climate was not found to be significantly related to were employee burnout and individual engagement. However, individual perceptions of the workgroup facet of health climate were significantly related to these two outcomes. This suggests that it is an individual's perception of the norms for health within their workgroup, rather than the shared perceptions about health norms among workgroup members, that drives both burnout and individual engagement.

Additionally, results from Study 2 found no support for possible relationships between the group-level mean aggregate of the supervisor/organization facet and burnout, stress, performance, engagement or organizational citizenship behaviors towards other employees. However, results indicate that individual perceptions of the supervisor/organization facet of health climate are significantly related to burnout, stress, performance, engagement, and organizational citizenship behaviors. Although these findings do not support the hypotheses that the combined supervisor/organization facet at the group-level should be related to all of these outcomes, the importance of individual perceptions of this facet is supported.

It is important to note in the group-level findings for the workgroup facet and supervisor/organization facet of health climate, that these results were obtained controlling for climate strength (i.e. variability). This was done because when aggregating individual perceptions of climate two groups can have similar mean aggregate scores yet differ significantly in terms of the range of individual perceptions within that team. Because climate strength might have an effect on the outcomes individuals experience as a result of being in particular workplace climates, the standard deviation aggregate was included in the models tested in Study 2. Previous climate studies involving climate strength have found that climate strength is related to outcomes such as affective commitment, organizational commitment, satisfaction with supervisors, and organizational citizenship behaviors (Sanders, Dorenbosch & de Reuver, 2007; Walumbwa, Wu & Orwa, 2008).

A lack of many significant results from the group-level analyses may suggest that there is a weak effect that the power of this sample cannot detect, highlighting the importance of using a larger sample size with more groups at level two and more clusters at level three to examine these relationships. However, this lack of results also suggests that it would be worthwhile to



consider other measurements of health climate specifically designed for these upper levels of analysis. Although isomorphism of construct is assumed in Study 2 because of the relatively early stages of the exploration of this construct, a lack of findings for any significance of the supervisor/organization facet at the group level might suggest that these items were not written to perform assessments at this level. Similar reasoning could be used to explain why no effects were found at the facility level. It is possible that new scales should be created in order to more accurately examine health climate at the workgroup and organization levels.

### **Cluster Analysis**

Findings from the k-means cluster analysis, similar to Study 1, suggest that workgroups can differ among the facets of health climate such that they can be high in the workgroup facet yet lower in the supervisor/organization sample. A four-cluster solution was extracted for Study 2 analyses. Although the number of workgroups in each cluster is lower than conventional standards for k-means cluster analysis, it was determined that this 4-cluster solution was based off of more than simply the number of groups ( $N=42$ ) because this analysis also accounted for the number of people nested within these groups. Although future research could explore this analysis approach with a larger number of workgroups, this is not thought to be a limiting factor in this study.

Interestingly, in the Study 2 sample there were very few groups who had higher levels of the supervisor/organization facet than the workgroup facet of health climate. This could be explained by the nature of the work involved in this sample in that it is highly reliant on working with others and also the very stressful nature of their job. Given the harsh environment that these individuals work in, there tends to be a necessity to rely on coworkers for support. This might then translate into support for coworkers' health, which is why the mean for the workgroup facet

of health climate is particularly high. Similarly in this particular sample, relevant to the structure of the organization mentioned earlier, there are general feelings of lack of support from management in general which could explain why there are very few groups that have higher ratings for the supervisor/organization facet than the workgroup facet. Because of this, the clusters that were extracted in the Study 2 k-means cluster analysis are not the same as the clusters that were extracted in the Study 1 k-means cluster analysis. Namely, we do not see empirically determined groups that were high in the supervisor/organization facet while simultaneously being lower in the workgroup facet. This is important to note for cluster comparison purposes.

The four groups that were determined in the cluster analysis were characterized by one cluster being high in all three facets, one cluster being low in all three facets, and two clusters that were similar in the supervisor and organization facets but differed in their levels of the workgroup facet of health climate. Using these four clusters, a discriminant function analysis was run in which the five outcomes of interest in the study were entered (stress, burnout, performance, engagement, and organizational citizenship behaviors). Results from this analysis suggest that the cluster that is high in all three of the facets performs much more positively on the function, and that the cluster that is low in all three facets performs the lowest on the function. Interestingly, 'Average' and 'Average-Higher Group' which have similar levels of the supervisor and organization facets but differ in the workgroup facet do not differ on this function. This is unexpected because 'Average-Higher Group' has significantly higher scores on the workgroup facet than 'Average'. Similarly, 'Average-Higher Group' can be compared the 'Positives', which was high in all three facets, because these two clusters have similarly high levels of the workgroup facet but they differ in that 'Average-Higher Group' is significantly lower on the

supervisor and organization facets. Results from the discriminant function analysis show that ‘Positives’ has a more positive score on the function than ‘Average-Higher Group’. The interpretation of this comparison in conjunction with the interpretation of the comparison between ‘Average’ and ‘Average-Higher Group’ suggest the importance of the supervisor and organization facets in the outcomes of job stress, burnout, engagement, performance, and organizational citizenship behaviors.

### **Group-level Interactions**

Findings from the HLM analyses that include group-level interaction terms between the two facets in this study suggest that the effect of one group-level facet on health and work-related outcomes does not depend on the levels of the other group-level facet. The interaction terms were not significant for any of the five outcomes, which might suggest that there are differential and additive effects for each of the facets. The interpretation of these effects should consider that in these models neither of the group-level facets were significantly related to any of the outcomes in these models.

Given these results, post-hoc tests were run to examine whether at the individual level effects of one facet depended on the level of perceptions of the other facet. Results indicate that this is not the case for the outcomes of burnout, job stress and individual engagement, but that the interaction is significant for employee performance and organizational citizenship behaviors. A finding of nonsignificant interactions for the outcomes of burnout, job stress and individual engagement could be due to the fact that these are more individualized and internal outcomes than the outcomes of organizational citizenship behaviors and performance, and therefore the effects of each facet on these outcomes is possibly more additive than interactive.

Additionally, the interpretation of the significant interactions on the outcomes of organizational citizenship behaviors towards other employees and performance indicate that, at least for these outcomes, the level of one facet does have an impact on the effect of the other facet. In both cases, the facets were positively related to the outcomes in that, as scores on the facets increased, so did levels of organizational citizenship behaviors and employee performance. However, when this was examined as an interaction, scores on both of these outcomes were much greater if individuals were highly positive on both of the facets. Although it was hypothesized that these interactions would occur among contexts at the group-level, these findings from the individual level indicate the importance of increasing individual's perceptions in each of the facets of health climate in order to experience the most positive outcomes.

### **Limitations**

The strength of Study 2 rests in its ability to replicate and extend some of the findings in Study 1 to multiple-levels of analysis. However one limitation is the low number of groups at the highest level of analysis. Although the number of facilities is large enough to examine and determine statistically significant fixed effects, a greater number of facilities would have provided more statistical power and allowed for more confidence in determining what level health climate exists at in its strongest form. Additionally, a limitation of Study 2 is the job sector it was carried out in. Correctional health care is a somewhat unique job, and seeing as Study 1 was also conducted in a correctional environment it would eventually be necessary to extend the findings from Study 2 about the facets of organizational health climate to other settings. It is possible that the health-related nature of the job in this sample is related to health climate perceptions of the employees. Furthermore, Study 2 as well as Study 1 assumed that

health climate is largely a social construct unrelated to the type of jobs that individuals hold. This limitation is addressed in Study 3.

### **Study 3**

Although the consideration of workplace climate inherently examines the context within which attitudes, behaviors and outcomes occur in the workplace, context can also be examined from a larger perspective. From an ecological-systems perspective, there are multiple levels of influence on an individual. Study 1 examines the individual-level influence of perceptions of workgroups, supervisors, and the organization, while Study 2 examines these same three facets from a group and facility-level. Both Study 1 and Study 2 explore organizational health climate as a within-organization phenomenon suggesting that regardless of the type of work or type of organization the health climate facets could be fostered through similar means. The social-ecological framework, however, suggests that although the influences within the organization are important, there might be a level above that influencing the climate such as the type of job, job characteristics or job context. Study 3 seeks to explore the idea of objective job characteristics as they are related to the three facets of MOHCA. Answering this question has important ramifications for designing intervention strategies to improve organizational health climate.

Job characteristics can be seen as environmental variables that tend to have an impact on employee attitudes and behavior (Spector & Jex, 1991). Although often job characteristics and work environments are thought about in the context of specific organizations, it is also true that they can be objectively applied across similar job types. For example, an individual working as a second grade teacher in New Jersey would be working for a different organization with perhaps differing values and climate than an individual working as a second grade teacher in California, however many of their job characteristics and duties will be similar. These job characteristics

(e.g., interacting with parents, preparing class materials) shape the experiences that employees have and, therefore, are likely to impact things such as perceptions and attitudes. This broad idea that job characteristics influence job attitudes and perceptions is reflected in Hackman and Oldham's (1976) Job Characteristics Theory which has been widely used and tested in the research literature. From a human factors perspective certain design factors of the job itself could either constrain or enable the employee to do their job in certain ways, resulting in a dynamic interaction between job design and how well the employee is able to perform their job.

Much of the research in the area of job characteristics and the testing of the Job Characteristics Theory has been done using self-report measures. Certain crucial subjective job characteristics such as job demands and autonomy have been found to be related with key aspects of job-related well-being (De Jonge & Schaufeli, 1998). Additionally, findings from a study by Pousette and Hanse (2002) also found differences between objective job sectors in the effects of perceived job characteristics on employee ill health. For example, job satisfaction was related to ill-health in white collar workers but was not in blue collar workers or care workers, while white-collar workers were the only group without a significant relationship between workload and ill-health (Pousette & Hanse, 2002). Although the study by Pousette and Hanse (2002) used subjective rather than objective job characteristics, their use of job sector suggests a possibility of the relevance of the objective job context on employee health. Other sources of objective job characteristics such as job control and job complexity have been linked to employee health, job satisfaction, anxiety, and turnover intentions (Spector & Jex, 1991). However, additional objective sources of data about job characteristics might be needed to more accurately determine the influence of the work environment on employees.

Although Hackman and Oldham (1976) emphasize that the core job characteristics in their Job Characteristics Theory are objective, they also express the importance of employee perceptions of their work environment. This is particularly relevant to the present study given the definition of organizational health climate, which is the “employee perceptions of active support from upper management as well as supervisors and coworkers for the physical and psychological well-being of employees” (Zweber et al., under review). These perceptions are expected to partially account for the relationship between job characteristics and workplace outcomes and may be indicative of the good fit between job design and worker health needs.

### **Occupational Information Network**

In order to examine objective job characteristics as they relate to the variables of interest in this study, the Occupational Information Network (O\*NET) database was used. O\*NET is an publically available online database of job characteristics that came out of a research project sponsored by the U.S. Department of Labor. This free of use O\*NET database contains information on the knowledge, skills, abilities, interests, work context, work values and work activities for a broad range of job titles. A number of research studies have used variables and/or composites from O\*NET to supplement self-reported data in their studies (Alterman, et. al, 2008; Liu, Spector, & Jex, 2005; Meyer, Cifuentes, & Warren, 2011). In the current study, multiple already validated composites will be used consisting of job control, physical job demands, and working with others. A discussion of each of these objective characteristics and their proposed relationships with the three facets of organizational health climate and workplace outcomes follows.

## **Job Control**

One composite from the O\*NET database that has commonly been used in research involving objective job characteristics is job control. Interest in this composite from O\*NET has stemmed from its relevance to the Job-Demands Control Model of stress. Previous research has found relationships between perceived control and coworker support as well as between perceived control and supervisor support (Thompson & Prottas, 2005). Although Thompson and Prottas (2005) found perceived control to be a mediator between these types of organizational support and employee work and well-being outcomes, the current study seeks to examine objective job control as a precursor to perceptions of support for health.

Although, much of the previous literature examines perceptions of control rather than objectively measuring aspects of job control, it is important to note the difference between these two as the focus of the current study is on actual control. Actual control and perceived control have been found to be related, yet their relationships with outcomes are not always consistent (Hackman, Pearce, & Wolfe, 1978; Jackson, 1983; Spector, 1986). Some jobs might inherently allow employees to have more control than other jobs. For example, a school teacher, while needing to work within a curriculum, has some level of control over how to manage his/her class room and how to teach certain lessons while a call center worker has a more structured job with less control over how and when their work can be done. This differs from perceived control in that some individuals may feel a sense of control even when there is minimal to actual control, and this positive perception can still lead to positive work and health outcomes (Spector, 1986). The current study seeks to answer whether actual control can impact perceptions of support. The Theory of Planned Behavior (Ajzen, 1991) suggests that perceived control is a major contributor to behavioral intentions and actual behavior. Although perceived control is the construct of



interest in this theoretical model, a degree of actual control is necessary to impact behavior intentions, behavior and outcomes (Ajzen, 2002). This thinking can be applied to the relationship between actual job control and work-related well-being outcomes in that regardless of perceived control, some level of actual job control is necessary to experience the benefits associated with job control.

Additionally, it is expected that this level of actual job control will drive perceptions about support from the organization, supervisors and coworkers. Specifically, it is expected that actual job control will impact perceptions of the three facets of health climate. The Job Characteristics Theory, as mentioned above, suggests that job characteristics can be related to employee attitudes and perceptions. Job control, in particular, is examined in this study because of the known relationship between perceived control and positive work and health-related outcomes. Given the known positive effects of job control, it is expected that employees who are in jobs with more control might be more likely to have positive perceptions about support from their organization, supervisors and coworkers. In other words, people who are in control of their jobs then have the ability to be more in control individually of their health and well-being. Thus, it is next hypothesized:

**H12:** Objective job control will be directly positively related to perceptions of the three facets of health climate.

**H13:** The three facets of health climate will partially mediate the relationship between objective job control and job stress, performance, fatigue, and healthy days.

### **Physical Job Demands and Occupational Risk**

In addition to objectively capturing whether certain jobs involve levels of job control, the physical demands of the job can also be objectively measured. In the Job Demands-Resources

(JD-R) Model of stress, high or unfavorable job demands, which consist of aspects of the job that require physical or mental effort, can lead to a constant state of overtaxing, and therefore lead to exhaustion and burnout (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The job demands in the JD-R Model focus on psychological job demands however the focus of the current study is on the actual physical demands of the job and the negative outcomes that are related to merely working in a job that is physically demanding. This difference is important to note, similar to the difference between perceived job control and actual job control discussed above, because while the physical demands of the job are likely related to the psychological demands, the JD-R Model posits that stress is an outcome of the psychological effects of the work load (Fox, Dwyer, & Ganster, 1993).

The Allostatic Load Theory can be applied to the explanation of the negative outcomes that are associated with physical job demands. This theory posits that the body needs to adjust various systems within the body in order to cope with challenges to the state of homeostasis (Ganster & Perrwew, 2011). Similarly, the term homeokinesis has been used to define the ability of an organism to function in an external environment by maintaining a relatively stable internal state, within certain limits of variability (Que, Kenyon, Olivenstein, Macklem, & Maksym, 2001). Applying both of these ideas, a job that is extremely physically demanding could cause a physical response in order for them to make adjustments to this stressor, according to this theory. Therefore, a physically demanding job should be associated with less favorable work and health-related outcomes for employees. In the discussion of the physical demands of the job and its potential relationships with workplace climate and health and work-related outcomes, research on occupational risk is also relevant. Perceived risk, defined as employees' perceptions of their

work environment as risky or dangerous, has been found to be associated with job satisfaction, stress-related symptoms, distraction, and injuries (McGonagle & Kath, 2010; McLain, 1995).

In addition to some physical job demands being associated with negative work and health outcomes, as previously mentioned, this type of environmental variable can also have an impact on attitudes and behavior. Hackman and Oldham (1976) reflect this in their Job Characteristics Theory by stating the influence of job characteristics on job attitudes and perceptions. Therefore, in the current study it is believed that these objective job characteristics such as the extreme physical demands of the job might influence perceptions of support from the organization in terms of health. In other words, although health climate has been defined and examined as a construct that is socially oriented and constructed, there might be some jobs where certain aspects of these jobs have some level of influence on whether the employees will feel their health is supported by the organization, supervisors and coworkers or not.

**H14:** Physical job demands will be directly negatively related to perceptions of the three facets of health climate.

**H15:** The three facets of health climate will partially mediate the relationship between physical job demands and job stress, performance, fatigue and healthy days.

### **Working With Others**

Another important objective job characteristic to examine in its relation to organizational health climate and employee work and health-related outcomes is whether the jobs involve working with others. This is expected to be particularly important to the concept of organizational health climate because the definition of climate is based on shared perceptions with others, and even at the individual level health climate is conceptualized as support from other coworkers, supervisors and the organization itself. However, some occupations involve

working with other people more so than other occupations. For example, firefighters work in teams, and are constantly working with others, whereas someone who works as a nighttime security guard might often be interacting very little with other coworkers. Previous research has found that the social environment at work is related to the psychological well-being of employees (Repetti, 1987). Although this relationship is likely contingent upon also having a positive social environment, the current study seeks to answer whether merely working with other individuals, versus not working with others, is associated with perceptions of support and work and health-related outcomes. It is expected that there will be a relationship between working with others and perceptions of the workgroup facet of health climate, in particular, because support cannot exist from your coworkers if there are no people around to provide this support. A relationship is not expected between working with others and the supervisor facet of health climate or between the organization facet and working with others because whether or not one has coworkers or individuals with whom they regularly work with, they still work for an organization and there is likely someone above them that they can feel some level of support from. Therefore, it is next hypothesized:

**H16:** Working with others will be directly positively related to perceptions of the workgroup facet of health climate.

**H17:** The workgroup facet of health climate will partially mediate the relationship between working with others and job stress, performance, fatigue and healthy days.

## **Method**

### **Participants and Procedure**

The sample is a cross-organizational sample comprised of 1191 full-time working adults who were recruited using a snowball sampling method where undergraduate psychology students

received partial course credit for recruiting working adults to participate in the study. For this sample, students from two different universities, one in the Northeast and one in the Midwest were used to recruit study participants. The study consisted of an online survey that focused on workplace safety and health.

In the survey, participants were also asked to provide their job title, job description and job type. This information was then used to connect to the O\*NET database which provided key objective job characteristics for this study. Of the participants, 289 (24%) did not provide information on their job titles and therefore were excluded from study analyses.. The online survey contained multiple “check” questions throughout the survey in order to ensure individuals are still reading the questions and anyone with bogus answers to these questions were eliminated from subsequent analyses. Of the 902 individuals who did provide information on job titles, 288 (32%) of these individuals did not pass these check questions that were dispersed throughout the survey

For inclusion in the study analyses, participants must also have answered all of the survey items related the variables of interest in this study. Therefore, the final sample consisted of 482 individuals. This sample was 60% female, 85% identified as white, and 53% had a college degree or higher.

## **Measures**

**Health climate.** As cited in Study 1, MOHCA was used to measure the three facets of health climate in Study 3.

**Healthy Days.** Healthy days was measured using an item from the Center for Disease Control’s Healthy Days measure (Moriarty, Zack & Kobau, 2003). This scale for this item was 1-5 where

participants were asked “would you say that in general your health is excellent, very good, good, fair or poor.”

**Performance.** Individual self-reported job performance was measured using four items adapted from a scale by Farh and colleagues (1991). Employees were asked the stem “How do you feel your performance is viewed by the SUPERVISOR... What does your supervisor (i.e., not you) think of...” and an example item is “...the quality of your work?” A previous alpha for this scale was .92.

**Fatigue.** Fatigue was measured using 3 items (Chalder, Berelowitz, Pawlikowska, Watts, Wessely, Wright & Wallace, 1993). An example item is “During the past six months, have you had problems with tiredness?” A previous reliability estimate of a longer version of this scale was .88.

**Job Stress.** Job stress was measured using 4 items from Stress in General/Job Stress scale (Stanton, Balzer, Smith, Parra & Ironson, 2001). An example item from this scale is “In general, I think my job is hectic.” A previous reliability estimate for this scale was .82.

### **Objective Job Characteristics from O\*NET**

The following composite scales were assessed via O\*NET variables. The variables used along with a short description of these variables can be seen in Table 13.

**Job Control.** Job control was assessed via a composite of variables from O\*NET that was validated by Meyer and colleagues (2011). Variables from O\*NET were selected for this composite based on their close correspondence to items that are assessed in the commonly used Job Content Questionnaire (JCQ). The five variables that were used were active learning, making decisions and solving problems, scheduling work activities, organizing, planning and prioritizing work, and freedom to make decisions.

**Physical Job Demands.** Physical job demands was assessed via a composite of variables from O\*NET that was validated by Hadden, Kravets and Muntaner (2004). There were ten variables used from O\*NET to make this composite: peripheral vision, spatial orientation, response orientation, gross body equilibrium, far vision, reaction time, stamina, speed of limb movement, spend time sitting, and indoors, environmentally controlled.

**Working With Others.** Working with others was measured using a composite of variables from O\*NET that was validated by Alterman and colleagues (2008). There were three variables used from O\*NET to make this composite: independence, co-workers, and social service.

### **Analysis Strategy**

Structural equation modeling techniques were used to test the Study 3 hypotheses. Exploratory and confirmatory factor analyses were performed on all measures used in the proposed model. First, the theoretical model was tested. Similar to Study 1, there was also reasoning for why some paths might be stronger than others. Therefore the model was next revised based on both theory and empirical support (significant increases in model fit).

Also similar to Study 1, multiple fit indices were used to examine the model fit. The chi square statistic was examined as well as the Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). A SRMR value close to .08, a CFI of .95 or higher, and an RMSEA of less than .06 indicates good fit (Hu & Bentler, 1999).

## Results

### Descriptive Statistics

Descriptive statistics including mean, standard deviation, minimum, maximum, number of items and coefficient alpha for all of the variables used in Study 3 can be seen in Table 14. Mean levels of the three facets of organizational health climate were relatively similar, 4.98, 4.65 and 4.76 for the workgroup, supervisor and organization facets respectively. Self-reported performance was relatively high with a mean of 4.15 on a scale of 1-5 and the other outcome variables were relatively average. A full correlation matrix between for 3 variables can be seen in Table 15.

### Model Testing

First, a model that included all of the hypothesized relationships was tested and had moderately good model fit (SRMR=.05, CFI=.91, RMSEA=.13). These results can be seen in Table 16. However, many of the direct relationships in this model were not significant and therefore the model was trimmed based on theory and empirical support. In the trimmed model, as seen in Figure 11, there were no direct relationships between working with others and job stress, between physical job demands and performance, and between working with others and fatigue. These paths were all deleted from the hypothesized model due to the fact that it made theoretical sense that these direct relationships might not be strong, and due to their lack of empirical support in this sample. The trimmed model did not differ much in statistical significance (SRMR=.05, CFI=.91, RMSEA=.08). A chi square difference test between these two models yielded a non-significant p-value indicating that the model with more added paths did not fit the data significantly better and therefore the trimmed model was retained and interpreted ( $\Delta\chi^2(9)=7.81, p>.05$ ). Although the trimmed model fit the data relatively well, not



all the paths were statistically significant still. However, this model was retained for analyses because indirect effects can sometimes be significant even if direct effects are not significant (Hayes, 2009).

### **Job Characteristics and Health Climate facets**

First, before examining mediation effects or relationships with work and health-related outcomes, the relationships between the objective job characteristics from O\*NET and health climate facets was examined. Results from the overall model testing that include these direct relationships can be seen in Table 17.

Hypothesis 12 posits that objective job control will be directly positively related to the perceptions of the three facets of organizational health climate. In order to test this hypothesis, direct paths were tested from job control to each of the three facets of health climate. Results indicate that there was a direct relationship between job control and the workgroup facet of health climate ( $B=.13, p<.01$ ). However, the relationship between job control and the supervisor facet as well as the relationship between job control and the organization facet of health climate did not yield significant results. Thus, Hypothesis 12 was only partially supported.

Hypothesis 14 suggests that physical job demands will be directly negatively related to perceptions of the three facets of health climate. Results from this model indicate that there was a significant direct relationship between physical job demands and the workgroup facet of health climate ( $B=-.11, p<.05$ ). However, the relationship between physical job demands and the supervisor facet of health climate as well as the relationship between physical job demands and the organization facet of health climate did not yield significant results. Thus, Hypothesis 14 was not supported.

Hypothesis 16 posits that working with others will be directly positively related to perceptions of the workgroup facet of health climate. Results from this model indicate that there was a significant direct relationship between working with others and the workgroup facet of health climate ( $B = -.08, p < .05$ ). Although this relationship is in the opposite direction than anticipated, Hypothesis 14 was partially supported in that there is a relationship between these two constructs.

### **Test of Indirect Effects**

As examined in Study 1, indirect effects were examined in Study 3 in order to explore the relationship between the health climate facets and physical and mental health outcomes. Bootstrapping was used in order to test the significance of these indirect effects (Mallinckrodt, Abraham, Wei, & Russell, 2006). Results from the tests of indirect effects can be seen in Table 18.

Hypothesis 13 suggests that the three facets of health climate will partially mediate the relationship between objective job control and 1) job stress, 2) performance, 3) fatigue and 4) healthy days. Results indicate that this hypothesis was partially supported. There was a significant indirect effect of objective job control on performance through the workgroup facet of health climate ( $95\%CI = .01$  to  $.05$ ). There were not significant indirect effects through the workgroup facet on job stress, fatigue or healthy days, and there were no significant indirect effects from job control to any of the outcomes through the supervisor or organization facets of health climate. Therefore, Hypothesis 13 was only partially supported.

Hypothesis 15 suggests that the three faces of health climate will partially mediate the relationship between physical job demands and 1) job stress, 2) performance, 3) fatigue, and 4) healthy days. Results indicate that this hypothesis was only partially supported. There was a

significant indirect effect of physical demands on performance through the workgroup facet of health climate (95%CI= -.06 to -.01). There were not significant indirect effects through the workgroup facet on job stress, fatigue, or healthy days, and there were no significant indirect effects from job control to any of the outcomes through the supervisor or organization facets of health climate. Therefore, Hypothesis 15 was only partially supported.

Hypothesis 17 suggests that the workgroup facet of health climate will partially mediate the relationship between working with others and 1) job stress, 2) performance, 3) fatigue and 4) healthy days. Results indicate that there were no significant indirect effects from working with others through the workgroup facet of health climate on any of these four outcomes. Therefore Hypothesis 17 was not supported.

### **Study 3 Discussion**

The purpose of Study 3 was to examine whether there were objective aspects of the job that contribute to perceptions of organizational health climate. The importance of answering this question lies in the fact that most types of workplace climate, including organizational health climate, are conceptualized as social constructs that can be cultivated by the organization. However, if certain objective aspects of job design were related to perceptions of health climate this would indicate that some portion of the climate perceptions in their organization could not be easily changed or influenced because they would partially be influenced by the job itself. A social ecological systems perspective would suggest that there is a level of influence above that of the organization, which is why this question was examined in Study 3.

Findings from Study 3 indicate that there are few direct relationships between the three objective job characteristics measured in this study and the three facets of health climate. In fact, the workgroup facet of health climate was the only one of the three facets that was directly

related to any of the objective job characteristics. The workgroup facet was significantly related to job control and physical job demands. Interestingly, the supervisor and organization facets were not significantly related to job control or physical job demands. One explanation for these findings to occur only with the workgroup facet of organizational health climate is that the coworker level is where these job characteristics, and differences between jobs, are largely at play. Interactions with coworkers and the way in which coworkers work together on job tasks do change quite significantly based on the type of job.

These results suggest that a job that is inherently physically demanding is associated with lowered perceptions of the workgroup facet of health climate. This could be because a job that is physically taxing on an individual could lead them to feel that he/she must carry a physical burden to carry out job tasks and that support from fellow coworkers could not help with these tasks. This could also suggest that individuals who work in jobs that are physically demanding are also working with coworkers whose jobs are similarly physically demanding. This could drive perceptions of the available support from coworkers for each other's health because if an individual sees that their coworker is burdened with physically demanding work, they might perceive a lack of resources available to that individual to help support his/her health. In other words, a very physically demanding job could take up so many of each person's individual resources, that they may perceive that no one has enough resources left to greatly support anyone else's health in a positive way.

These results also suggest that jobs that inherently involve a greater level of control are associated with more positive perceptions of the workgroup facet of health climate. This is consistent with past research that has found relationships between perceptions of control and

perceptions of support (Thompson & Prottas, 2005). This study extends those findings by finding a relationship between objective control and perceptions of support for health from coworkers.

A lack of findings of many of the direct relationships between objective job characteristics and health climate perceptions provides evidence for the fact that health climate is largely socially constructed, as originally defined. This finding suggests that it is not predominantly the type of job itself that leads to individuals feeling a climate for health in their organization. This has important implications for all different types of organizations. For example, organizations that involve particularly risky jobs might think that because of the nature of the work, they will never be able to create a climate for health among their employees. However, results from this study suggest that this is not the case, and that the organization and supervisors should be able to take actions to help cultivate a healthy workplace environment. Similarly, organizations that are largely comprised of low-risk, high control jobs, consisting of mostly office workers, might think that they do not need to do much to create a culture of support for health in their organization because health is not an issue given the work that they do. However, results from this study suggest that this would not be the case, and that organizations and members within the organization should actively work to create a climate of support for health within the organization that can be readily perceived by employees.

Although the direct relationships between objective job characteristics and perceptions of the three facets of health climate were the main focus of Study 3, this study also sought to examine whether these objective job characteristics lead to similar work and health-related outcomes, and whether perceptions of the three facets of health climate mediated these relationships. Findings show there were only two significant indirect effects through the workgroup facet of health climate. There was a significant indirect effect of objective job control

on performance through the workgroup facet of health climate, and a significant indirect effect of physical demands on job performance through the workgroup facet of health climate. These findings suggest that job performance can be affected by objective aspects of the job such as job control and physical job demands, but these same objective aspects do not have much of an effect on the health-related outcomes. A lack of findings for direct or other indirect effects might suggest the greater importance of employee perceptions rather than these objective aspects. Previous research on perceived control and psychological job demands have found many relationships with workplace outcomes, but a lack of findings here could suggest that actual control and actual physical demands alone don't necessarily have a large impact on workplace health-related outcomes.

### **Limitations**

Although the strength of Study 3 rests in the use of an external source of objective data about the job characteristics and work context of specific jobs, the weakness of this study is that it does not supplement this with other objective outcome data. Multi-source or objective data about employee health and performance would strengthen any potential findings of this study. Additionally, one of the major issues with using O\*NET data in a sample like this is that it is important to have a sample from a variety of jobs so as to get enough variance on the job characteristics. Although efforts were made in the collection of this sample to get a variety of jobs, especially including jobs where safety was a salient issue, the descriptive statistics show that there is not great variability among these constructs. Having a larger spectrum of workers in terms of their objective job control, physical job demands and extent of working with others would allow for a more complete test of how these job characteristics may influence perceptions of health climate and work and health-related outcomes. Lastly, one limitation of this study is

due to the general nature of the job characteristics in the O\*NET dataset. These general job characteristics do not take into account specific organizations and other objective support that they may have in place such as employee assistance programs and proper trainings.

### **General Discussion**

Through these three studies with different samples of workers and job settings, a number of important questions surrounding the construct of organizational health climate have been explored. From a social-ecological model framework, the influence of coworkers, supervisors, the organization, group perceptions and objective job characteristics can all be important and need to be examined systematically. Using a within-organization sample, Study 1 explored the three facets of MOHCA in ways not done before, as well as answered the question of whether organizational health climate is both directly and indirectly related to objective health outcomes. In particular, the strength of the sample used in Study 1 was the use of objective health data from physical assessments. Significant findings from Study 1 provide a convincing case for organizations and researchers regarding the importance of organizational health climate. Similarly, Study 2 extended these findings by examining this phenomenon at a workgroup level, and by connecting health climate with other important workplace outcomes. The multi-level nature of the sample in Study 2 allowed for a deeper analysis of health climate. Findings from Study 2 in conjunction with findings from Study 1 provide a more convincing argument for the need for organizations to focus interventions that will benefit workers' health and improve the health climate within their organizations as well as for researchers to continue to study this important topic. Lastly, Study 3 provides a further view of health climate by using objective data about job characteristics in combination with health climate perceptions. Significant findings from Study 3 with the workgroup facet point to the importance of considering what type of job

employees are working in before designing interventions to improve the workgroup facet of organizational health climate. Additionally, this finding would suggest to researchers the importance of studying health climate and its manifestation from a human factors design perspective in a variety of different workplaces to better understand the interactions between job design, job control, health climate and health outcomes.

Together, these three studies with unique samples provide empirical evidence for why organizations and researchers should care about organizational health climate. Study 1 found indirect relationships through health behavior intentions and workplace sense of coherence on employee health. Study 2 found direct relationships between the facets of health climate (mostly at the individual-level) and job stress, burnout, performance, employee engagement and organizational citizenship behaviors. Similarly, Study 3 found direct relationships between the workgroup and organization facets of health climate and performance and fatigue. Findings from all three of these studies indicating relationships between the health climate facets and these important work and health-related outcomes alone give reason for organizations to become cognizant of the climate for health within their organization and how to constantly maintain and improve this climate.

Additionally, Study 1 and Study 2 findings from k-means analysis and DFA point to the relevance of all of the three facets of health climate together. Findings from these two studies suggest that strength in all three of the facets leads to more favorable outcomes than when one or more of the facets is not as strong. This is important for organizations and researchers to understand because, for example, just because an organization has the resources for employee health, and holds many health-related events, does not mean that its supervisors support employee health. Therefore, organizations cannot just rely on trying to cultivate healthy



workplace climate from the top down. Instead, support for health will also need to come from the bottom. A grassroots approach might be better for gaining an understanding of how employees are treating employee health amongst themselves and become a source of ideas for how to improve this coworker support for health (Robertson, Henning, Warren, Nobrega, Dove-Steinkamp, Tibirica & Bizarro, 2013). This approach could also be useful for employees to identify any issues with their supervisors' support of workplace health and how this could be improved.

In addition to replicating important findings between the three studies, such as the outcomes that are associated with the three facets of health climate and the finding that strength in all three facets is the most beneficial, examining differences in findings from the three studies was also of interest. The major important difference that was found was the fact that in Study 2 the supervisor and organization facets of health climate were not differentiated. This finding is important because it highlights the importance of knowing the target sample and whether certain levels, as determined in the MOHCA measure, are appropriate for certain populations. In the Study 2 sample it became clear that the supervisor and organization facets were too intertwined based on the structure of this organization and therefore they were collapsed into one measure for purposes of the analysis. This might be true for other organizations as well, or it could also be true that an additional level of support for health is important in certain types of organizations, expanding the number of facets to four. This is important for future researchers and organization leaders to consider when measuring health climate in their workplace.

Similarly, in thinking about the findings of these three studies, it is important to consider the samples that were used. Study 1 consists of correctional officers, Study 2 consists of correctional health care workers and Study 3 is a cross-organization sample. These three

different samples were chosen in order to examine health climate in multiple types of organizations. Interestingly, Study 3 did not find many relationships between objective job characteristics and perceptions of the health climate facets. Findings from Study 3 did not suggest that having two samples that are both relevant to the stressful and risky corrections setting significantly biased the results that were found regarding the role of health climate.

### **Practical Implications**

Findings from these three studies have important practical implications for organizations. First, findings from all three of the studies point to the value of examining each of the three facets of health climate separately rather than only as one construct. Relatedly, findings from Study 1 and Study 2 point to the importance of organizations developing positive climates in all three of these areas. This has important implications for organizations when developing interventions to benefit employee health, and potentially health climate perceptions. Lastly, findings from these three studies show consistent support for the importance of caring about employee health. This is particularly relevant in the current political climate and as organizations seek to remain or become competitive in terms of recruiting employees. Having an organization that is known for having a very positive climate for employee health due to support from all levels of the organization could be a very important draw for competitive applicants now and in the future.

### **Future Research**

Although these three studies sought to answer many important questions surrounding organizational health climate, much work around this construct still needs to be done. One important area of future research is to examine the possible antecedents of health climate and its three facets. Answering this question could help to lay the groundwork for another important

area of future research which is to explore possible interventions for improving workplace health climate perceptions. Additionally future studies could examine other outcomes associated with health climate as well as examine this construct over time and in different types of organizations. Longitudinal designs could help to explore causal effects of health climate and how it develops or changes over time in an organization or workgroup.

### **Summary**

Overall, these three studies in combination can enlighten researchers and organizations about the importance of organizational health climate. These three complementary studies have allowed for determining the outcomes of health climate, at what level health climate might exist and whether health climate is more dependent on objective job context or socially constructed within organizations. These are all important pieces to the puzzle of what organizational health climate is and why it matters. With increasing attention on health in today's workplace, further research on organizational health climate and related constructs could help contribute to a better understanding of this phenomenon as well as help to further translate these research findings into practice and create healthier organizations and employees.

## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- Ajzen, I. (2002). Constructing a TPB questionnaire: Conceptual and methodological considerations.
- Al-Rahimi, F. (1990). An analytical study of job satisfaction in Saudi Arabian public sector. Unpublished PhD thesis, University of Liverpool.
- Albertsen, K., Nielsen, M. L., & Borg, V. (2001). The Danish psychosocial work environment and symptoms of stress: the main, mediating and moderating role of sense of coherence. *Work & Stress*, 15(3), 241-253.
- Alterman, T., Grosch, J., Chen, X., Chrislip, D., Petersen, M., Krieg, E., ... & Muntaner, C. (2008). Examining associations between job characteristics and health: linking data from the Occupational Information Network (O\* NET) to two US national health surveys. *Journal of Occupational and Environmental Medicine*, 50(12), 1401.
- Barnard, J. (1997). The workplace environment: what do technical workers want? *Industrial Management*, 39(5), 14-16.
- Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley.
- Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds), *Handbook of child: Volume 1: Theoretical Models of Human Development* 5<sup>th</sup> ed. (pp. 993-1028). Hoboken, NJ: John Wiley & Sons Inc.
- Carr, J. Z., Schmidt, A. M., Ford, J., & DeShon, R. P. (2003). Climate perceptions matter: A meta-analytic path analysis relating molar climate, cognitive and affective states, and individual level work outcomes. *Journal Of Applied Psychology*, 88(4), 605-619.

- Chalder, T., Berelowitz, G., Pawlikowska, T., Watts, L., Wessely, S., Wright, D., & Wallace, E. P. (1993). Development of a fatigue scale. *Journal of psychosomatic research*, 37(2), 147-153.
- Chen, G., Mathieu, J. E., & Bliese, P. D. 2004. A framework for conducting multilevel construct validation. In F. J. Dansereau & F. Yammarino (Eds.), Research in multi-level issues: The many faces of multi-level issues, Vol. 3: 273-303. Oxford, U.K.: Elsevier Science.
- Cohen, J. (1992). A power primer. *Psychological bulletin*, 112(1), 155.
- Cohen, S., & Wills, T. A. (1985) Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Cohen, S. & Syme, S. L. (Eds) (1985). *Social Support and Health*. New York: Academic Press.
- De Jonge, J., & Schaufeli, W. B. (1998). Job characteristics and employee well-being: A test of Warr's Vitamin Model in health care workers using structural equation modelling. *Journal of Organizational Behavior*, 19(4), 387-407.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2000). The job demands-resources model of burnout. *Journal of Applied Psychology*, 86, 499-512.
- Deurenberg, P., Yap, M., & van Staveren, W. A. (1998). Body mass index and percent body fat: a meta analysis among different ethnic groups. *International Journal of Obesity & Related Metabolic Disorders*, 22(12).
- Diez-Roux, A. V. (2000). Multilevel analysis in public health research. *Annual review of public health*, 21(1), 171-192.
- Edwards, J. R. (1992). A cybernetic theory of stress, coping, and well-being in organizations. *Academy of management review*, 17(2), 238-274.

- Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of applied psychology*, 75(1), 51.
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71, 1026-1040.
- Ettner, S. L., & Grzywacz, J. G. (2001). Workers' perceptions of how jobs affect health: A social ecological perspective. *Journal of Occupational Health Psychology*, 6(2), 101.
- Farh, J. L., Dobbins, G. H., & CHENG, B. S. (1991). Cultural relativity in action: A comparison of self-ratings made by Chinese and US workers. *Personnel Psychology*, 44(1), 129-147.
- Feldt, T., Kinnunen, U., & Mauno, S. (2002). A meditational model of sense of coherence in the work context: A one-year follow-up study. *Journal of Organizational Behavior*, 21(4), 461-476.
- Fox, M. L., Dwyer, D. J., & Ganster, D. C. (1993). Effects of stressful job demands and control on physiological and attitudinal outcomes in a hospital setting. *Academy of Management Journal*, 36(2), 289-318.
- Ganster, D. C., & Perrewe, P. L. Theories of Occupational Stress. *Handbook of Occupational Health Psychology Second Edition*.
- Ganster, D. C., & Victor, B. (1988). The impact of social support on mental and physical health. *British Journal of Medical Psychology*, 61, 17-36.
- Gavin, J. F., & Howe, J. G. (1975). Psychological climate: Some theoretical and empirical considerations. *Behavioral Science*, 20(4), 228-240.

- Glick, W. H. (1985). Conceptualizing and measuring organizational and psychological climate: Pitfalls in multilevel research. *Academy of Management review*, 10(3), 601-616.
- Gottlieb, B. H. (Ed.) (1983). *Social Support Strategies*. Beverly Hills, CA: Sage.
- Grawitch, M. J., Trares, S., & Kohler, J. M. (2007). Healthy workplace practices and employee outcomes. *International Journal Of Stress Management*, 14(3), 275-293.
- Green, L. W., & Kreuter, M. W. (2005). *Health program planning: an educational and ecological approach*. New York: McGraw-Hill.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational behavior and human performance*, 16(2), 250-279.
- Hackman, J. R., Pearce, J. L., & Wolfe, J. C. (1978). Effects of changes in job characteristics on work attitudes and behaviors: A naturally occurring quasi-experiment. *Organizational Behavior and Human Performance*, 21(3), 289-304.
- Hadden, W. C., Kravets, N., & Muntaner, C. (2004). Descriptive dimensions of US occupations with data from the O\* NET. *Social Science Research*, 33(1), 64-78.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420.
- Hitt, M. A., Beamish, P. W., Jackson, S. E. & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management Journal*, 50, 1385-1399.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513-524.
- House, J. S. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley Publishing Company.

- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Ilmarinen, J., Tuomi, K., Eskelinen, L., Nygard, C. H. et-al. (1991). Background and objectives of the Finnish research project on aging workers in municipal occupations. *Scandinavian Journal of Work, Environment and Health*. 17 (Suppl 1), 7-11.
- Jackson, S.E. (1983). Participation in decision making as a strategy for reducing job-related strain. *Journal of Applied Psychology*, 68, 3 - 19.
- James, L. R., & Jones, A. P. (1974). Organizational climate: A review of theory and research. *Psychological bulletin*, 81(12), 1096.
- Jones-Johnson, G., & Johnson, W. R. (2001). Subjective underemployment and psychosocial stress: The role of perceived social and supervisor support. *The Journal of Social Psychology*, 132(1), 11-21.
- Kahn, R., Wolfe, D., Quinn, R., Snoek, J., & Rosenthal, R. (1964). *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: Wiley.
- Kath, L. M., Roesch, S. C., & Ehrhart, M. G. (2013). An overview of multilevel modeling in occupational health psychology. In R. R. Sinclair, M. Wang & L. E. Tetrick (Eds.) *Research Methods in Occupational Health Psychology* (pp. 395-414). New York, NY: Routledge.
- Kawakami, N., Araki, S., Kawashima, M. Masumoto, T., & Hayashi, T. (1997). Effects of work-related stress reduction on depressive symptoms among Japanese blue-collar workers. *Scandinavian Journal of Work Environment and Health*, 23, 54-59.



- Kawakami, N., Kobayashi, Y., Takao, S., & Tsutsumi, A. (2005). Effects of web-based supervisor training on supervisor support and psychological distress among workers: a randomized controlled trial. *Preventive Medicine, 41*(2), 471-478.
- Kessler, R. C. & Mcleod, J. D. (1985). Social support and mental health in community studies. In S. Cohen & L. Syme (Eds), *Social Support and Health*, pp. 219-238. New York: Academic Press.
- Kinman, G. (2008). Work stressors, health and sense of coherence in UK academic employees. *Educational Psychology, 28*(7), 823-835.
- Klein, K. J., Tosi, H., & Cannella, A. A. (1999). Multilevel theory building: Benefits, barriers, and new developments. *Academy of Management Review, 24*(2), 243-248.
- Landsbergis, P. A., & Vivona-Vaughan, E. (1995). Evaluation of an occupational stress intervention in a public agency. *Journal of Organizational Behavior, 16*, 19-48.
- LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods, 11*(4), 815-852.
- Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment on burnout and organizational commitment. *Journal of organizational behavior, 9*(4), 297-308.
- Liu, C., Spector, P., & Jex, S. (2005). The relation of job control with job strains: A comparison of multiple data sources. *Journal of Occupational and Organizational Psychology, 78*(3), 325-336.
- Mallinckrodt, B., Abraham, W. T., Wei, M., & Russell, D. W. (2006). Advances in testing the statistical significance of mediation effects. *Journal of Counseling Psychology: Brief Reports, 53*(3), 372-378.

- McGonagle, A. K., & Kath, L. M. (2010). Work-safety tension, perceived risk, and worker injuries: A meso-mediational model. *Journal of safety research*, 41(6), 475-479.
- McLain, D. L. (1995). Responses to health and safety risk in the work environment. *Academy of Management Journal*, 38(6), 1726-1743.
- Meyer, J. D., Cifuentes, M., & Warren, N. (2011). Association of self-rated physical health and incident hypertension with O\* NET factors: Validation using a representative national survey. *Journal of Occupational and Environmental Medicine*, 53(2), 139-145.
- McEwen, B. S. (1998). Protective and damaging effects of stress mediators. *New England Journal of Medicine*, 338, 171-9.
- McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education & Behavior*, 15(4), 351-377.
- Miranda, H., Punnett, L., Gore, R., & Boyer, J. (2011). Violence at the workplace increases the risk of musculoskeletal pain among nursing home workers. *Occupational and environmental medicine*, 68(1), 52-57.
- Miranda, H., Punnett, L., & Gore, R. J. (2014). Musculoskeletal Pain and Reported Workplace Assault A Prospective Study of Clinical Staff in Nursing Homes. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 56(1), 215-227.
- Moorman, R. H., Blakely, G. L., & Niehoff, B. P. (1998). Does perceived organizational support mediate the relationship between procedural justice and organizational citizenship behavior?. *Academy of Management journal*, 41(3), 351-357.
- Moriarty, D., Zack, M., & Kobau, R. (2003). The Centers for Disease Control and Prevention's Healthy Days Measures—Population tracking of perceived physical and mental health over time. *Health and Quality of Life Outcomes*, 1(1), 37.

- National Center for Health Statistics (US. (2007). Chartbook on Trends in the Health of Americans.
- Newman, J. E., & Beehr, T. A. (1979). Personal and organizational strategies for handling job stress: A review of research and opinion. *Personnel Psychology*, 32(1), 1-43.
- Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington Books/DC Heath and Com.
- Organ, D. W. (1990). The motivational basis of organizational citizenship behavior. *Research in organizational behavior*, 12(1), 43-72.
- Ostroff, C., Kinicki, A. J., & Tamkins, M. M. (2003). Organizational culture and climate. *Handbook of psychology*.
- Papper, E. (1983). *Individual and organizational effects of perceived work load*. Unpublished doctoral dissertation, Bowling Green State University.
- Patterson, M., Warr, P., & West, M. (2004). Organizational climate and company productivity: The role of employee affect and employee level. *Journal of Occupational and Organizational Psychology*, 77(2), 193-216.
- Pousette, A., & Hanse, J. J. (2002). Job characteristics as predictors of ill-health and sickness absenteeism in different occupational types--a multigroup structural equation modeling approach. *Work & Stress*, 16(3), 229-250.
- Powell, C. N., & Butterfield, D. A. (1978). The case for subsystem climates in organizations. *Academy of Management Review*, 3(1), 151-157.
- Que, C. L., Kenyon, C. M., Olivenstein, R., Macklem, P. T., & Maksym, G. N. (2001). Homeokinesis and short-term variability of human airway caliber. *Journal of Applied Physiology*, 91(3), 1131-1141.

- Radloff, L.S. (1977). The CES-D Scale: A Self-Report Depression Scale For Research in the General Population. *Applied Psychological Measurement*, 1(3), 385-401.
- Rantanen, T., Harris, T., Leveille, S. G., Visser, M., Foley, D., Masaki, K., & Guralnik, J.M. (2000). Muscle strength and body mass index as long-term predictors of mortality in initially healthy me. *Journal of Gerontology: Medical Sciences*, 55(3), M168-M173.
- Raudenbush, S. W. (1997). Statistical analysis and optimal design for cluster randomized trials. *Psychological Methods*, 2(2), 173.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Sage.
- Raudenbush, S., Bryk, A., Cheong, Y. F., Congdon, R., & du Toit, M. (2004). HLM 6: Linear and Nonlinear Modeling. Lincolnwood, IL: Scientific Software International.
- Raudenbush, S. W., & Liu, X. (2000). Statistical power and optimal design for multisite randomized trials. *Psychological methods*, 5(2), 199.
- Reichers, A. E., & Schneider, B. (1990) Climate and culture: An evolution of constructs. In Schneider, B. (Ed.) *Organizational Climate and Culture*, pp. 5-39. Jossey-Bass: San Francisco
- Rentsch, J. R. (1990). Climate and culture: Interaction and qualitative differences in organizational meanings. *Journal of Applied Psychology*, 75, 668-681.
- Repetti, R. L. (1987). Linkages between work and family roles. *Applied social psychology annual*.
- Roberson, Q. M., Sturman, M. C., & Simons, T. L. (2007). Does the measure of dispersion matter in multilevel research? A comparison of the relative performance of dispersion indexes. *Organizational Research Methods*, 10(4), 564-588.

- Robertson, M., Henning, R. H., Warren, N., Nobrega, S., Dove-Steinkamp, M., Tibirica, L., & Bizarro, A. (2013). The intervention design and analysis scoreboard: A planning tool for participatory design of integrated health and safety interventions in the workplace. *Journal of Environmental Medicine*, 55(12), S86-S88.
- Rothbard, N. P. (2001). Enriching or depleting? The dynamics of engagement in work and family roles. *Administrative Science Quarterly*, 46(4), 655-684.
- Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology*, 21(7), 600-619.
- Saksvik, P. Ø., Nytrø, K., Dahl-Jørgensen, C., & Mikkelsen, A. (2002). A process evaluation of individual and organizational occupational stress and health interventions. *Work & Stress*, 16(1), 37-57.
- Salazar, M. K., & Beaton, R. (2000). Ecological model of occupational stress. Application to urban firefighters. *AAOHN journal: official journal of the American Association of Occupational Health Nurses*, 48(10), 470.
- Sanders, K., Dorenbosch, L., & de Reuver, R. (2008). The impact of individual and shared employee perceptions of HRM on affective commitment: considering climate strength. *Personnel Review*, 37(4), 412-425.
- Sauter, S. L., Murphy, L. R., & Hurrell, J. J. (1990). Prevention of work-related psychological disorders. *American Psychologist*, 45, 1146-1158.
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire a cross-national study. *Educational and psychological Measurement*, 66(4), 701-716.
- Schaufeli, W.B., Salanova, M., Gonzalez-Roma, V. and Bakker, A.B. (2002), "The measurement of engagement and burnout: a two sample confirmatory factor analytic approach",

Journal of Happiness Studies, Vol. 3, pp. 71-92.

Schneider, B. (1975). Organizational Climates: An Essay. *Personnel Psychology*, 28(4), 447-479.

Schneider, B., & Reichers, A. E. (1983). On the etiology of climates. *Personnel psychology*, 36(1), 19-39.

Schneider, M., & Stokols, D. (2009). Multilevel theories of behavior change: a social ecological framework. *The handbook of health behavior change*, 3, 85-105.

Shore, L. M., & Wayne, S. J. (1993). Commitment and employee behavior: comparison of affective commitment and continuance commitment with perceived organizational support. *Journal of Applied Psychology*, 78(5), 774.

Smith, K. U. (1979). Human-factors and systems principles for occupational safety and health: Module 20. Prepared for the U.S. Department of Health, Education, and Welfare .

Spector, P. E. (1986). Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work. *Human relations*, 39(11), 1005-1016.

Spector, P. E., & Jex, S. M. (1991). Relations of job characteristics from multiple data sources with employee affect, absence, turnover intentions, and health. *Journal of Applied Psychology*, 76(1), 46.

Stanton, J. M., Balzer, W. K., Smith, P. C., Parra, L. F., & Ironson, G. (2001). A general measure of work stress: The stress in general scale. *Educational and Psychological Measurement*, 61(5), 866-888.

Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American journal of health promotion*, 10(4), 282-298.

Suliman, A. M., & Abdulla, M. H. (2005). Towards a high-performance workplace: managing corporate climate and conflict. *Management decision*, 43(5), 720-733.

- Thompson, C. A., & Prottas, D. J. (2006). Relationships among organizational family support, job autonomy, perceived control, and employee well-being. *Journal of occupational health psychology, 11*(1), 100.
- Vogt, K., Jenny, G. J., & Bauer, G. F. (2013). Work-related sense of coherence as a measure of a health-promoting work situation. *SA Journal of Industrial Psychology, 39*(1).
- Walsh, B.M., Magley, V.J., Reeves, D. W., Davies-Schriels, K.A., Marmet, M.D. & Gallus, J.A. (2011). Assessing workgroup norms for civility: The development of the civility norms questionnaire. *Journal of Business and Psychology.*
- Walumbwa, F. O., Wu, C., & Orwa, B. (2008). Contingent reward transactional leadership, work attitudes, and organizational citizenship behavior: The role of procedural justice climate perceptions and strength. *The Leadership Quarterly, 19*(3), 251-265.
- Ware, J.E., Kosinski, M., Turner-Bowker, D.M., Gandek, B. (2002). SF-12v2™: How to Score Version 2 of the SF-12® Health Survey. Lincoln, RI: QualityMetric Incorporated.
- Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management journal, 40*(1), 82-111.
- Whelton, P. K., He, J., Appel, L. J., Cutler, J. A., Havas, S., Kotchen, T. A., ... & National High Blood Pressure Education Program Coordinating Committee. (2002). Primary prevention of hypertension: clinical and public health advisory from The National High Blood Pressure Education Program. *Jama, 288*(15), 1882-1888.
- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of management, 17*(3), 601-617.

- Wills, T. A. (1985). Supportive functions of interpersonal relations. In S. Cohen & L. Syme (Eds), *Social Support and Health*, pp. 61-78. New York: Academic Press.
- Wilson, M. G., DeJoy, D. M., Vandenberg, R. J., Richardson, H. A., & McGrath, A. L. (2004). Work characteristics and employee health and well-being: Test of a model of healthy work organization. *Journal Of Occupational & Organizational Psychology*, 77(4), 565-588.
- Winnubust, J. A. M., Marcelissen, F. H. G., & Kleber, R. J. (1982). Effects of social support in the stressor-strain relationship: A Dutch sample. *Social Science Medicine*, 16(1), 475-482.
- Zweber, Z. M., Henning, R. A., & Magley, V. J. (2013). A practical scale for multi-faceted organizational health climate assessment. *Under review. (Submitted August 2013).*

Table 1  
Study 1 Survey Descriptives

Scale	Min	Max	M	SD	#items	Alpha
Health Climate	1	7	3.84	1.24	8	0.88



Workgroup HC	1	7	4.59	1.46	2	0.57
Supervisor HC	1	7	3.61	1.63	2	0.93
Organization HC	1	7	3.59	1.41	4	0.88
Behavior						
Intentions	1	5	3.5	1	5	0.84
Comprehensibility	1	7	5.09	1.17	3	0.74
Manageability	1	7	4.27	1.19	2	0.53
Meaningfulness	1	7	4.36	1.5	3	0.82
Job stress	0	3	1.2	0.81	6	0.84
Depression	1	4	1.52	0.47	10	0.77
SF-12 Mental	NA	NA	48.77	10.89	12	NA
Burnout	1	7	3.98	1.25	4	0.8

Table 2  
Physiological  
Measures

	Calculations	M	SD	Range
Handgrip Strength	Weight (lbs)/grip strength (lbs)*	1.96	0.53	NA
Body fat percentage	NA	2.49	1.25	well below average risk (0) - well above average risk (4)
Blood Pressure	Systolic/diastolic	2.93	2.02	normal (0)- Hypertension (6)

Note. \*The average of the weight to grip strength ratio was taken from the right and left hand

Table 3  
Study 1 Correlation Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Overall Health Climate														
2. Workgroup HC	.68**													
3. Supervisor HC	.85**	.42**												
4. Organization HC	.93**	.44**	.71**											
5. Behavior Intentions	.16**	.17**	0.08	.14*										
6. Work-SOC: comprehensibility	.35**	.30**	.21**	.34**	.22**									
7. Work-SOC: manageability	.29**	.23**	.17**	.28**	0.12	.49**								
8. Work-SOC: meaningfulness	.30**	.17**	.23**	.31**	.17**	.45**	.26**							
9. Handgrip strength	0.01	-0.03	0.04	0.02	-.14*	-0.04	-0.04	0.08						
10. Blood pressure classification	0.02	0.01	0.01	0.02	-0.06	-0.04	-0.04	-0.1	0.07					
					-									
11. Bodyfat classification	-0.04	-0.03	-0.01	-0.01	.23**	-0.05	-0.05	-0.06	.44**	0.1				
Mental Health														
12. job stress	.13*	.13*	.09	.13*	.08	.27**	.20**	.20**	-.04	-.05	-.03			
13. depression	.28**	.24**	.19**	.26**	.29**	.38**	.27**	.28**	-.12	-.05	-.20	.32**		
14. SF-12 Mental	.16**	.16**	.07	.16**	.26**	.38**	.28**	.24**	-.09	.03	-.15*	.34**	.71**	
15. Burnout	.25**	.15*	.20**	.25**	.12*	.40**	.29**	.36**	-.14*	-.08	-.08	.39**	.50**	.54**

Note. \* indicates  $p < .05$ , \*\* indicates  $p < .01$ .

Table 4  
Study 1 Final Model Structural Paths

Predictor	<u>Outcome</u>					Handgrip Strength	Blood pressure	Bodyfat	Mental
	Intentions	Comprehensibility	Manageability	Meaningfulness					
Workgroup	.17*	.22**	0.16	0.01					0.04
Supervisor	-0.04	-0.01	0.05	-0.04					0
Organization	0.06	.28**	.23*	.35**					0.06
Intentions						-0.15	-0.02	-0.24	.14*
Comprehensibility						-0.03	0.11	0.06	.25**
Manageability						-0.02	-0.06	-0.06	0.1
Meaningfulness						0.11	-0.14	0.02	0.1

Note. \*Indicates  $p < .05$ , \*\*Indicates  $p < .01$

Table 5  
Study 1 Indirect Effects

a		b				
IV	Mediator	DV	a*b	CI lower	CI upper	
			-			
<b>workgroup</b>	<b>intentions</b>	<b>handgrip strength</b>	<b>0.03</b>	<b>-0.06</b>	<b>-0.01</b>	
supervisor	intentions	handgrip strength	0.01	-0.03	0.05	
			-			
organization	intentions	handgrip strength	0.01	-0.05	0.02	
			-			
<b>workgroup</b>	<b>intentions</b>	<b>blood pressure</b>	<b>0.04</b>	<b>-0.08</b>	<b>-0.01</b>	
supervisor	intentions	blood pressure	0.01	-0.04	0.06	
			-			
organization	intentions	blood pressure	0.01	-0.07	0.03	
workgroup	intentions	Body fat percentage	0	-0.03	0.02	
supervisor	intentions	Body fat percentage	0	-0.02	0.02	
organization	intentions	Body fat percentage	0	-0.02	0.02	
workgroup	intentions	mental health	0.02	0	0.05	
supervisor	intentions	mental health	0	-0.04	0.02	
organization	intentions	mental health	0.01	-0.02	0.04	
			-			
workgroup	comprehensibility	handgrip strength	0.01	-0.06	0.03	
supervisor	comprehensibility	handgrip strength	0	-0.02	0.03	
			-			
organization	comprehensibility	handgrip strength	0.01	-0.06	0.05	
workgroup	comprehensibility	blood pressure	0.02	-0.01	0.07	
			-			
supervisor	comprehensibility	blood pressure	0.01	-0.04	0.01	
organization	comprehensibility	blood pressure	0.03	-0.02	0.09	
workgroup	comprehensibility	Body fat percentage	0.01	-0.02	0.06	
			-			
supervisor	comprehensibility	Body fat percentage	0.01	-0.03	0.01	
			-			
organization	comprehensibility	Body fat percentage	0.01	-0.06	0.05	
<b>workgroup</b>	<b>comprehensibility</b>	<b>mental health</b>	<b>0.05</b>	<b>0.02</b>	<b>0.11</b>	
supervisor	comprehensibility	mental health	0.02	-0.01	0.03	

Table 5  
Indirect Effects  
(continued)

IV	Mediator	DV	a*b	CI lower	CI upper
<b>organization</b>	<b>comprehensibility</b>	<b>mental health</b>	<b>0.07</b>	<b>0.02</b>	<b>0.14</b>
workgroup	manageability	handgrip strength	0	-0.03	0.03
supervisor	manageability	handgrip strength	0	-0.01	0.02
organization	manageability	handgrip strength	0	-0.04	0.03
			-		
workgroup	manageability	blood pressure	0.01	-0.05	0.02
supervisor	manageability	blood pressure	0	-0.02	0.03
			-		
organization	manageability	blood pressure	0.01	-0.05	0.03
			-		
workgroup	manageability	Body fat percentage	0.01	-0.04	0.02
supervisor	manageability	Body fat percentage	0	-0.01	0.03
			-		
organization	manageability	Body fat percentage	0.01	-0.06	0.02
workgroup	manageability	mental health	0.02	0	0.05
			-		
supervisor	manageability	mental health	0.01	-0.03	0.01
organization	manageability	mental health	0.03	0	0.06
workgroup	meaningfulness	handgrip strength	0	-0.02	0.02
supervisor	meaningfulness	handgrip strength	0	-0.04	0.02
organization	meaningfulness	handgrip strength	0.04	-0.01	0.11
workgroup	meaningfulness	blood pressure	0	-0.03	0.02
supervisor	meaningfulness	blood pressure	0.01	-0.03	0.04
			-		
organization	meaningfulness	blood pressure	0.05	-0.11	0
workgroup	meaningfulness	Body fat percentage	0	-0.01	0.01
supervisor	meaningfulness	Body fat percentage	0	-0.02	0.02
			-		
organization	meaningfulness	Body fat percentage	0.01	-0.06	0.05

Table 5  
Indirect Effects  
(continued)

IV	Mediator	DV	a*b	CI lower	CI upper
workgroup	meaningfulness	mental health	0	-0.02	0.02
supervisor	meaningfulness	mental health	0	-0.03	0.02
organization	meaningfulness	mental health	0.04	-0.01	0.1

Table 6  
Study 2 Descriptives

Scale	Min	Max	M	SD	# items	Alpha
Health climate	1	7	3.91	1.29	9	0.87
Workgroup HC Supervisor/Organization	1	7	4.71	1.39	2	0.69
HC	1	7	3.65	1.44	7	0.87
Burnout	1	7	4,59	1.33	4	0.71
Job Stress	0	3	1.83	0.9	6	0.81
Performance	1	5	3,93	0.68	9	0.88
Engagement	1	7	5.1	1.28	10	0.93
OCB-E	1	7	6.1	0.96	2	0.85



Table 7

Individual-level Correlation table

	1	2	3	4	5	6	7
1. Overall Health Climate							
2. Workgroup facet	.67**						
3. Supervisor/Organization facet	.97**	.49**					
4. Burnout	-.45**	-.31**	-.40**				
5. Job Stress	-.38**	-.19**	-.40**	.40**			
6. Performance	.30**	.24**	.30**	-.15	-.22**		
7. Engagement	.35**	.20*	.36**	-.67**	-.36**	.23**	
8. OCB-E	.17*	0.11	.17*	-.33**	-.13	.30**	.46**

Note. \* indicates  $p < .05$ , \*\* indicates  $p < .01$ . OCB-E= organizational citizenship behaviors towards other employees.

Table 8  
Aggregate Correlation Table

	1	2	3	4	5	6	7	8	9	10
<b>Group-level</b>										
1. overall health climate										
2. workgroup facet	0.74									
3. supervisor/organization facet	0.98	0.57								
<b>Facility-level</b>										
4. overall health climate	0.6	0.4	0.59							
5. workgroup facet	0.5	0.49	0.44	0.84						
6. supervisor/organization facet	0.59	0.36	0.6	0.99	0.74					
<b>Individual-level outcomes</b>										
7. burnout	-.19	-.19	-.18	-.03	-.05	-.02				
8. job stress	-.27	-.17	-.28	-.16	-.11	-.17	.40			
9. Performance	0.25	0.27	0.23	0.15	0.1	0.15	-.15	-.22		
10. Engagement	0.22	0.2	0.22	0.01	0	0.01	-.67	-.36	0.23	
11. OCB-E	0.17	0.19	0.15	0.08	0.07	0.08	-.33	-.13	0.3	0.46

Note. P-values are not reported because of the aggregate variables.

Table 9  
RWG and ICCs

					Group- level	Group- level	Facility- level	Facility- level
Facet of health climate	Level 1 alpha	Level 2 alpha	rwg(j) Mean	rwg(j) Median	ICC (1)	ICC(2)	ICC(1)	ICC(2)
workgroup	0.69	0.65	0.61	0.68	0.11	0.33	0.06	0.19
supervisor/organization	0.87	0.88	0.74	0.78	0.07	0.24	0.16	0.4

Table 10

Results from Hierarchical Linear Modeling Analyses for the workgroup facet of health climate

Predictor	Dependent Variable				
	Burnout	Job Stress	Performance	Engagement	OCB-E
Individual-level workgroup facet	-.29 (.07)**	-0.09 (.06)	.06 (.04)	.19 (.07)**	-.01 (.06)
group-level mean aggregate of workgroup facet		-.26 (.12)*	.23 (.09)*		.34 (.13)**
group-level standard deviation aggregate of workgroup facet		-.44 (.16)**	.20 (.13)		.30 (.18)

Note. \* indicates  $p < .05$ , \*\* indicates  $p < .01$

Table 11

Results from Hierarchical Linear Modeling Analyses for the supervisor/organization facet

Predictor	Dependent Variable				
	Burnout	Job Stress	Performance	Engagement	OCB-E
	-.38	-.25			.11
Individual-level supervisor/organization facet	(.07)**	(.04)**	.13(.03)**	.33 (.06)**	(.05)*

Note. \*\* indicates  $p < .01$ , \* indicates  $p < .05$

Table 12

Predictor	Dependent variable				
	Burnout	Job Stress	Performance	Engagement	OCB-E
<b>Group-level</b>					
workgroup facet	-.75(.53)	.13(.36)	-.27(.31)	.81(.53)	-.08(.44)
supervisor/organization					
facet	-.74(.69)	.13(.46)	-.53(.40)	.76(.67)	-.45(.56)
interaction	.18(.13)	-.04(.09)	.11(.08)	-.16(.13)	.08(.11)
<b>Individual-level</b>					
workgroup facet	-.12(.09)	.02(.06)	.01(.05)	-.04(.09)	-.06(.07)
supervisor/organization					
facet	-.35(.09)**	-.23(.06)**	.11(.04)*	.32(.09)**	.11(.07)

Note. \* indicates  $p < .05$ , \*\* indicates  $p < .01$ . Standard errors are presented in parentheses.

Table 13

O\*NET Variables

Variable	Description
<b>Job Control</b>	
Active Learning	Understanding the implications of new information for both current and future problem-solving and decision-making.
Making decisions & solving problems	Analyzing information and evaluating results to choose the best solution and solve problems.
Scheduling work activities	Scheduling events, programs, and activities, as well as the work of others.
organizing, planning and prioritizing work	Developing specific goals and plans to prioritize, organize, and accomplish your work.
Freedom to make decisions	How much decision making freedom, without supervision, does the job offer?
<b>Physical Job Demands</b>	
peripheral vision	The ability to see objects or movement of objects to one's side when the eyes are looking ahead.
Spatial orientation	The ability to know your location in relation to the environment or to know where other objects are in relation to you.
Response orientation	The ability to choose quickly between two or more movements in response to two or more different signals (lights, sounds, pictures). It includes the speed with which the correct response is started with the hand, foot, or other body part.
Gross body equilibrium	The ability to keep or regain your body balance or stay upright when in an unstable position.
Far vision	The ability to see details at a distance.
Reaction Time	The ability to quickly respond (with the hand, finger, or foot) to a signal (sound, light, picture) when it appears.
Stamina	The ability to exert yourself physically over long periods of time without getting winded or out of breath.
Speed of limb movement	The ability to quickly move the arms and legs.
Spend time sitting	How much does this job require sitting?

**Table 13 (continued)****O\*NET Variables**

Indoors, environmentally  
controlled

How often does this job require working indoors in environmentally controlled conditions?

**Working With Others**

Independence

Workers on this job do their work alone.

Coworkers

Workers on this job have co-workers who are easy to get along with.

Social service

Workers on this job have work where they do things for other people.

---



Table 14  
Study 3 Descriptive Statistics

Variable	Mean	SD	Min	Max	# of items	alpha
workgroup HC	4.98	1.29	1	7	2	0.61
Supervisor HC	4.65	1.29	1	7	3	0.89
Organization HC	4.76	1.41	1	7	4	0.88
Job stress	1.76	1.11	0	3	4	0.81
Performance	4.15	0.66	1	5	3	0.94
Fatigue	2.84	0.74	1	5	3	0.83
Health Days	3.63	0.81	1	5	1	NA
Job Control	3.65	0.4	0	7	5	0.87
Physical Demands	1.55	0.42	0	7	10	0.92
Working with Others	3.88	0.5	0	7	3	0.73

Table 15  
Study 3 Correlation Table

Variable	1	2	3	4	5	6	7	8	9
1. Workgroup facet HC									
2. Supervisor facet HC	.37**								
3. Organization facet HC	.47**	.68**							
4. Fatigue	-.08*	-.06	-.13**						
5. Job Stress	.05	0	.04	.26**					
6. Healthy Days	.25**	.09*	.15**	.15**	.20**				
7. Performance	.11**	.12**	.14**	.21**	-.08	.11**			
8. Job control	.12**	.04	.02	-.07	.04	.10*	.17**		
9. Physical Job Demands	.15**	-.08	-.04	.02	-.02	.03	.07	.15**	
10. Working with others	-.08	-.02	-.05	.01	.03	-.04	.12**	.34**	.10*

Note. \*\* indicates  $p < .01$ , \* indicates  $p < .05$

Table 16  
Study 3 Initial Model Structural Paths

Predictor	Outcome						
	workgroup HC	Supervisor HC	Organization HC	Job Stress	Performance	Fatigue	Healthy Days
workgroup HC				-.03	.25**	-.04	.03
Supervisor HC				-.06	-.03	.08	-.07
Organization HC				-.07	.07	-.15*	.07
Job Control	.13**	-.01	-.03	.20**	.08	-.05	.03
Physical Demands	-.11*	-.08	-.06	.09	.08	0	-.03
Working with others	-.08*			.04	-.07	.02	.04

Note. \*Indicates  $p < .05$ , \*\* indicates  $p < .01$ .

Table 17  
Study 3 Final Model Structural  
Paths

Predictor	Outcome						
	workgroup HC	Supervisor HC	Organization HC	Job Stress	Performance	Fatigue	Healthy Days
workgroup HC				-0.04	.25**	-0.05	.04
Supervisor HC				-0.06	-0.04	0.07	-.07
Organization HC				-0.07	0.07	-.14*	.07
Job Control	.13**	-.01	-.03	.23**			
Physical Demands	-.11*	-.08	--.06	.09*			
Working with others	-.08*						

*Note.* \*Indicates  $p < .05$ , \*\* indicates  $p < .01$ .

Table 18  
Study 3 Indirect Effects

	a	b			
IV	Mediator	DV	a*b	CI lower	CI upper
Job Control	Workgroup HC	Job Stress	-0.01	-0.023	0.01
Job Control	Workgroup HC	Fatigue	-0.01	-0.03	0.01
<b>Job Control</b>	<b>Workgroup HC</b>	<b>Performance</b>	<b>0.03</b>	<b>0.01</b>	<b>0.07</b>
Job Control	Workgroup HC	Healthy Days	0.01	-0.01	0.02
Job Control	Supervisor HC	Job Stress	0	-0.01	0.01
Job Control	Supervisor HC	Fatigue	0	-0.01	0.01
Job Control	Supervisor HC	Performance	0	-0.01	0.07
Job Control	Supervisor HC	Healthy Days	0	-0.01	0.01
Job Control	Organization HC	Job Stress	0	-0.01	0.01
Job Control	Organization HC	Fatigue	0	-0.01	0.02
Job Control	Organization HC	Performance	0	-0.02	0.01
Job Control	Organization HC	Healthy Days	0	-0.01	0.01
Physical Demands	Workgroup HC	Job Stress	0	-0.01	0.02
Physical Demands	Workgroup HC	Fatigue	0.01	-0.01	0.02
<b>Physical Demands</b>	<b>Workgroup HC</b>	<b>Performance</b>	<b>-0.03</b>	<b>-0.06</b>	<b>-0.01</b>
Physical Demands	Workgroup HC	Healthy Days	0	-0.02	0.01
Physical Demands	Supervisor HC	Job Stress	0.01	-0.01	0.02
Physical Demands	Supervisor HC	Fatigue	0	-0.01	0.02
Physical Demands	Supervisor HC	Performance	0	-0.01	0.02
Physical Demands	Supervisor HC	Healthy Days	0.01	-0.01	0.02
Physical Demands	Organization HC	Job Stress	0	-0.01	0.02
Physical Demands	Organization HC	Fatigue	0.01	-0.01	0.03
Physical Demands	Organization HC	Performance	0	-0.02	0.01
Physical Demands	Organization HC	Healthy Days	0	-0.02	0.01
Working With Others	Workgroup HC	Job Stress	0	-0.01	0.02
Working With Others	Workgroup HC	Fatigue	0	-0.01	0.02
Working With Others	Workgroup HC	Performance	-0.02	-0.05	0
Working With Others	Workgroup HC	Healthy Days	0	-0.02	0.01

Figure 1  
Overall Health Climate Model

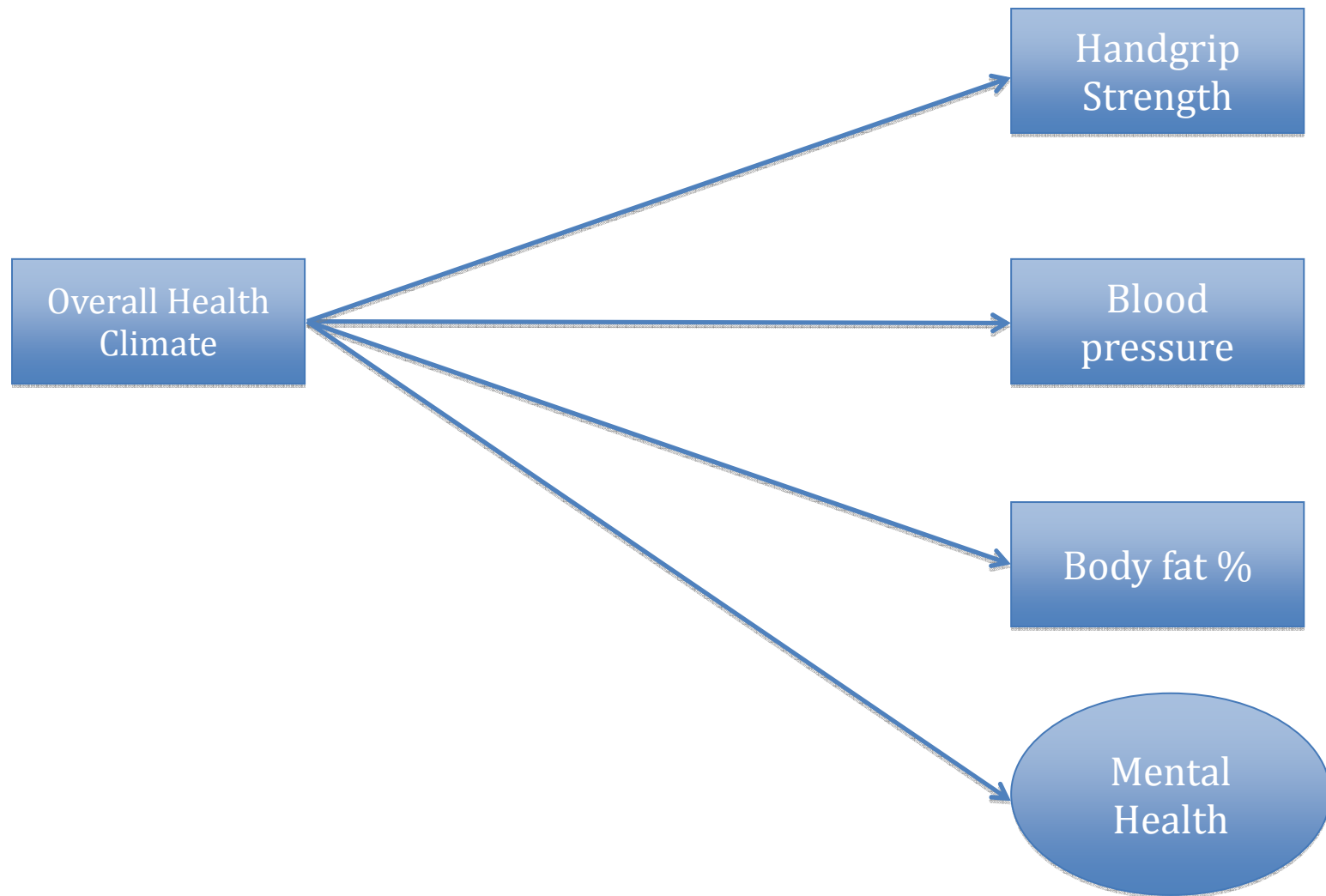


Figure 2  
Study 1 Final Model

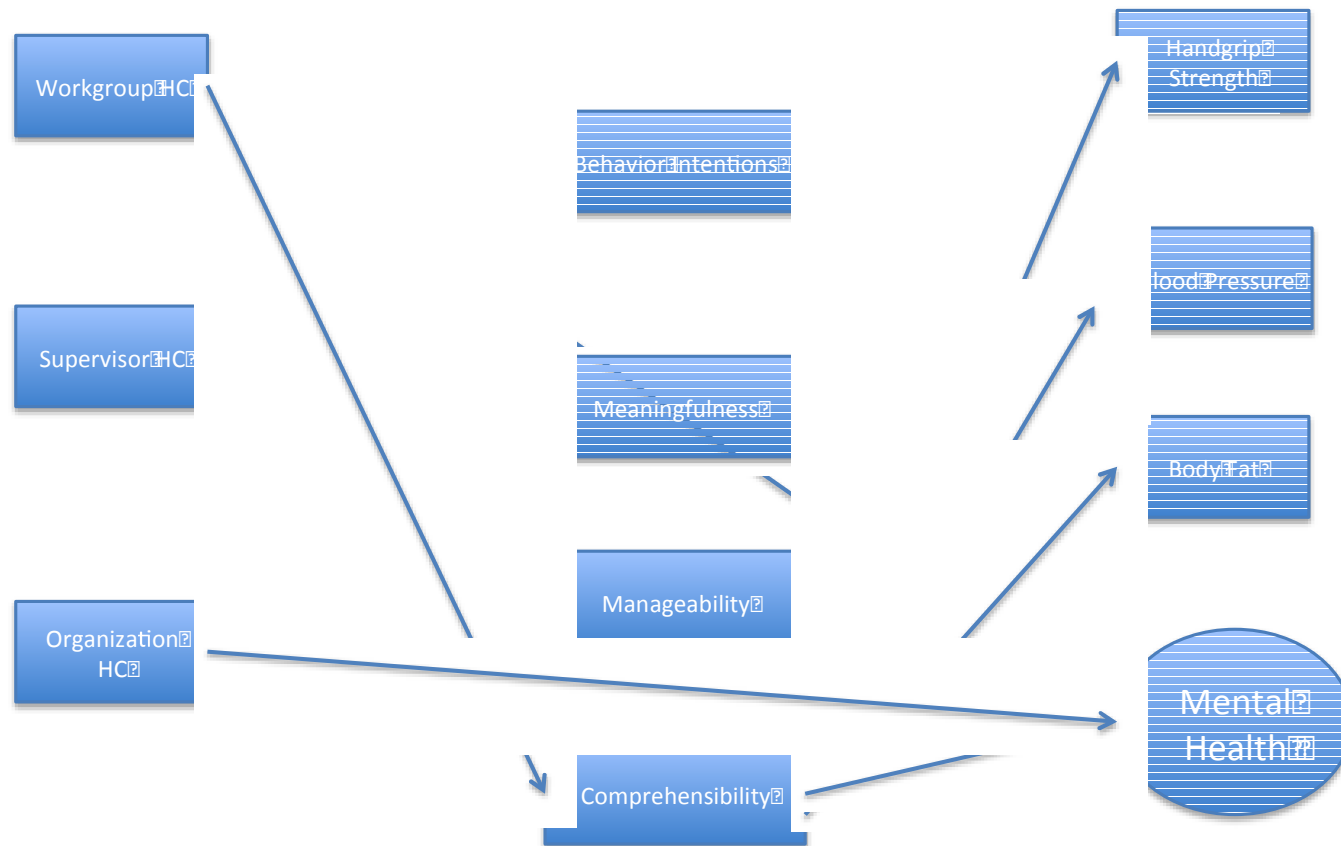


Figure 3  
Study 1 K-means Cluster Solution

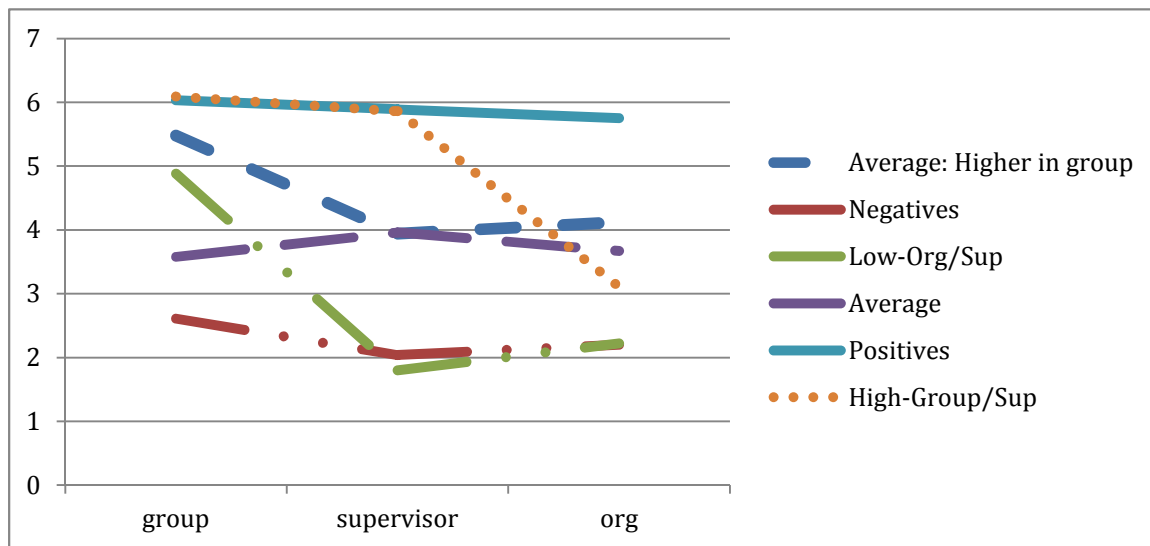




Figure 4  
Study 1 DFA Group Centroids

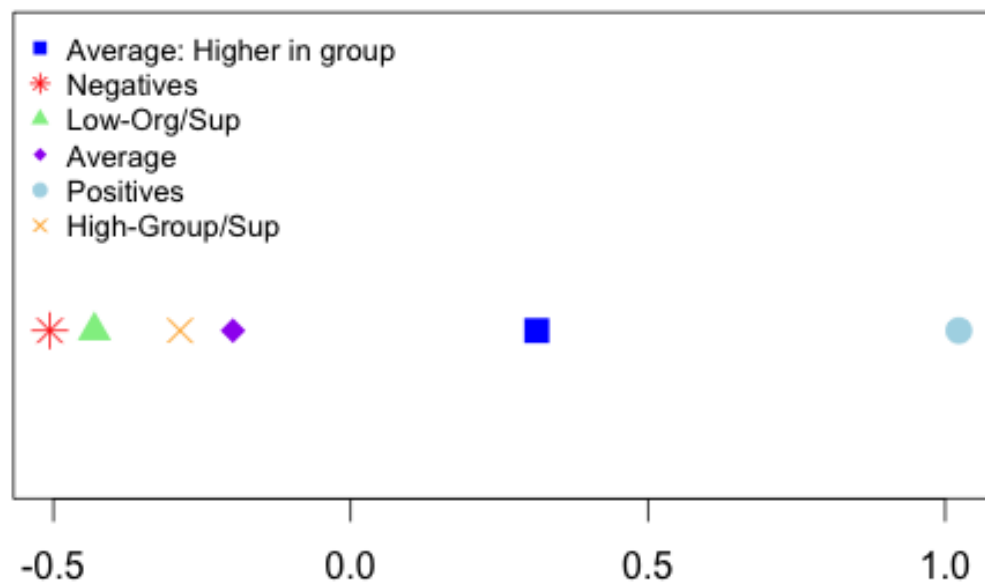


Figure 5  
Level-3 Power Analysis

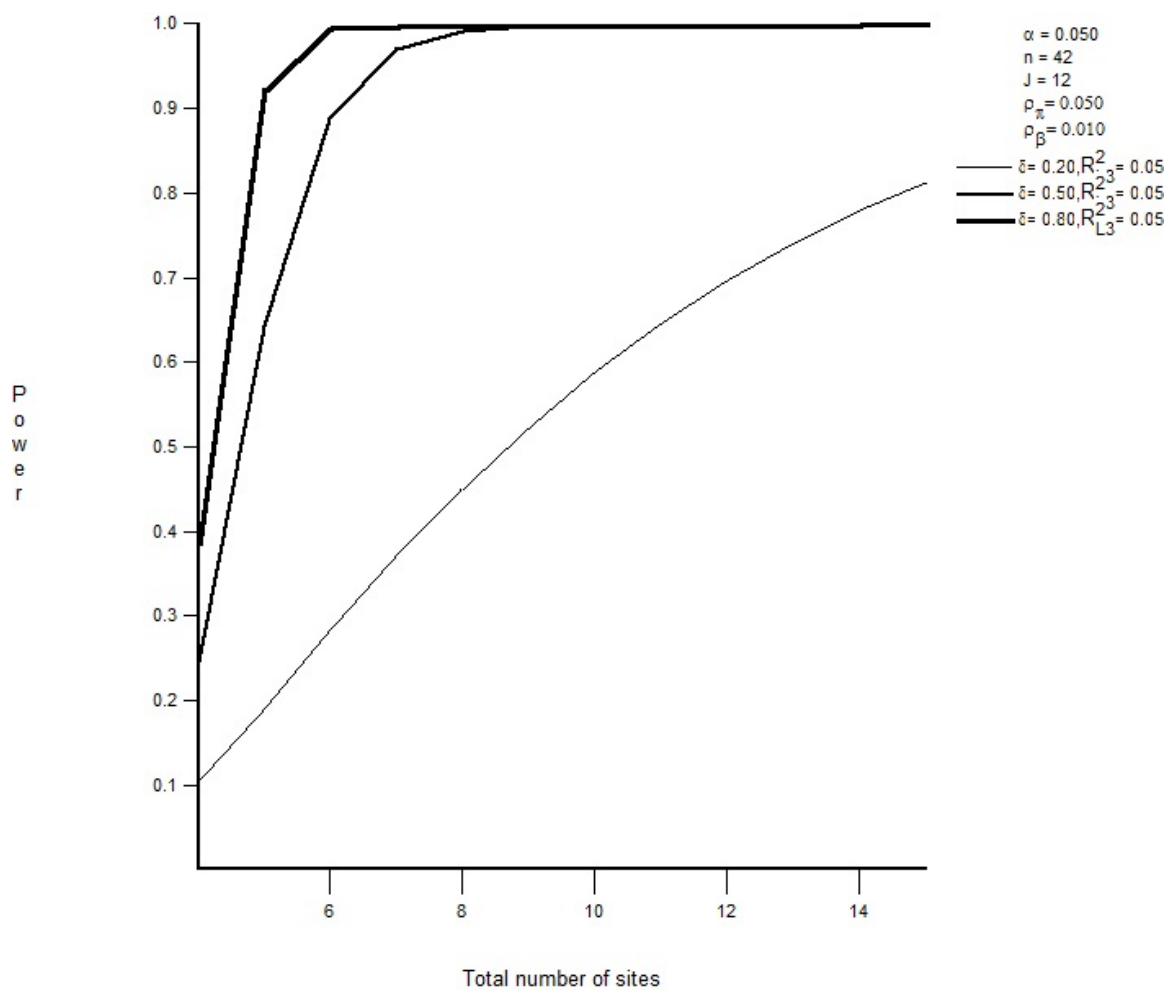


Figure 6  
Level-2 Power Analysis

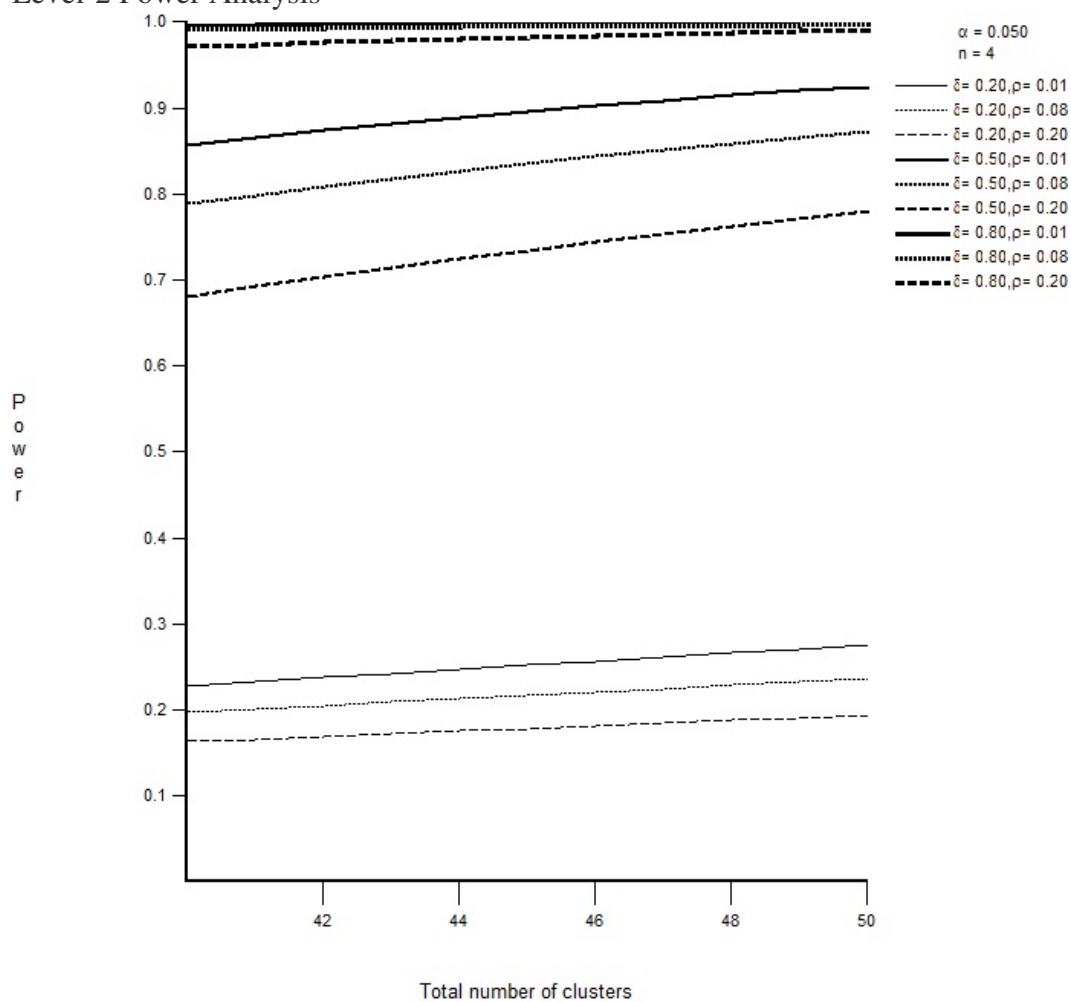


Figure 7  
Study 2 Final Clusters

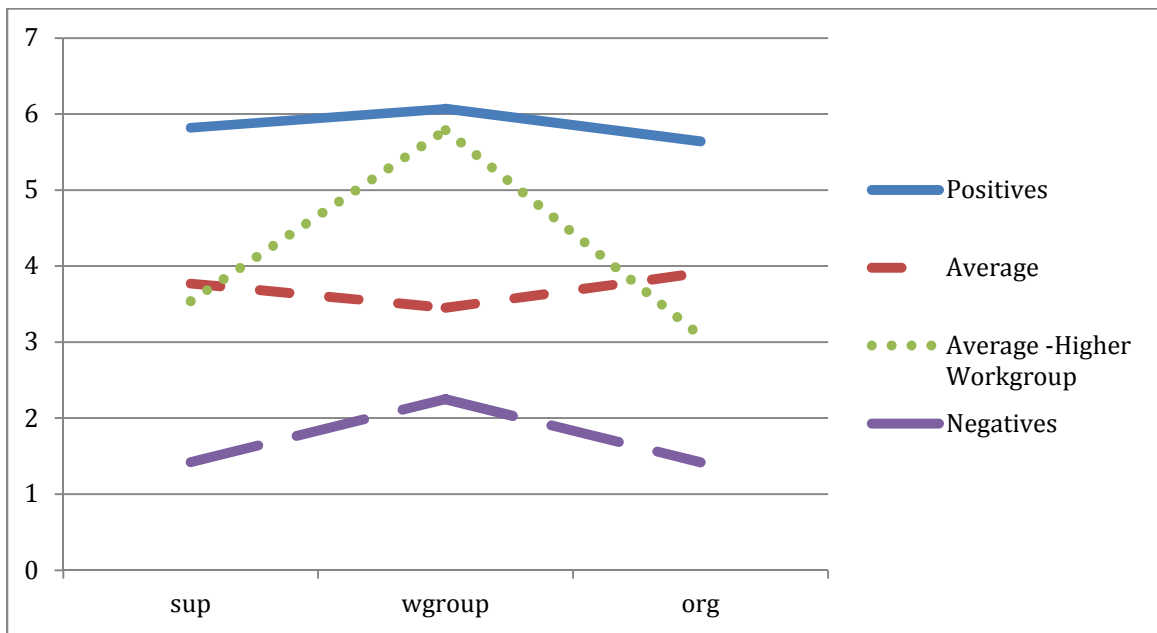


Figure 8  
Discriminant Function Analysis Group Centroids

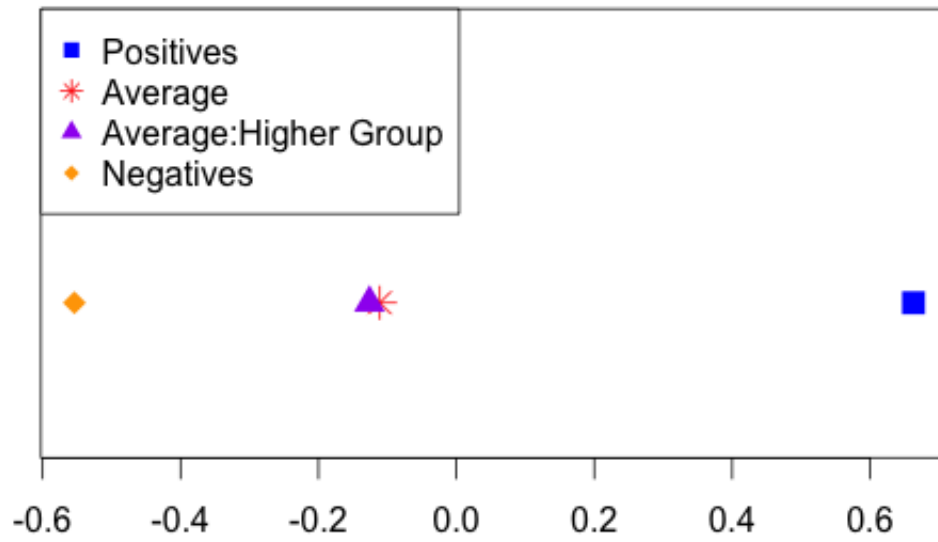


Figure 9  
OCB interaction plot

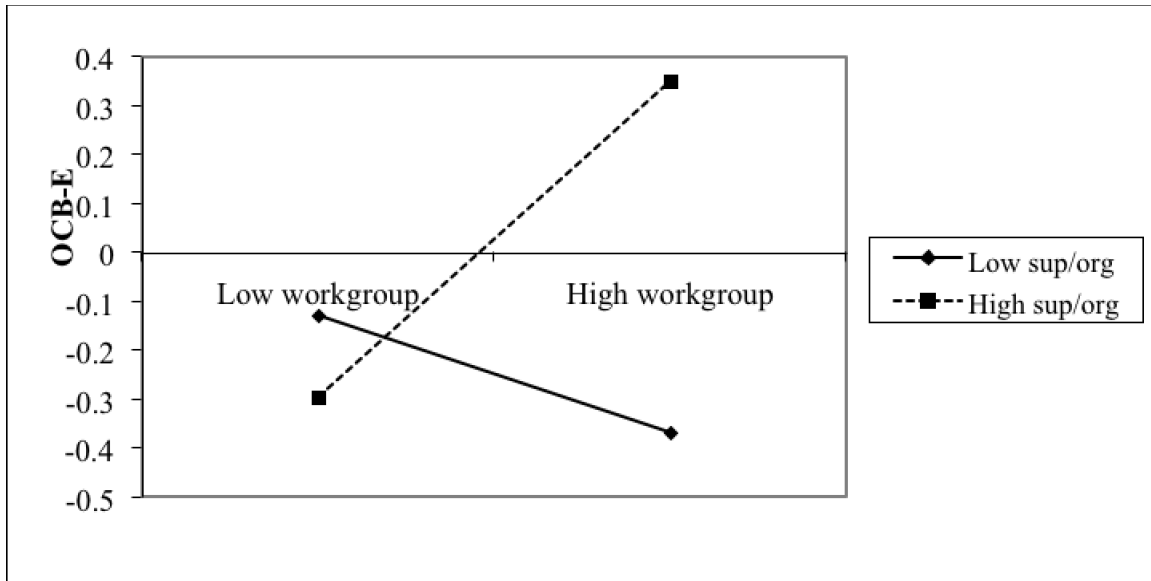


Figure 10  
Performance Interaction Plot

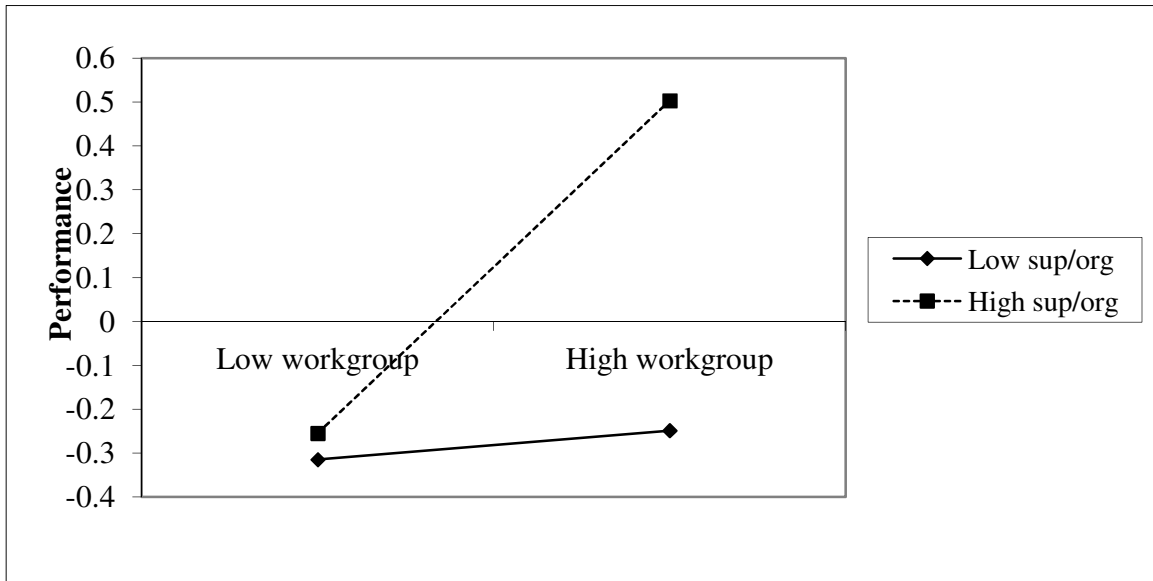
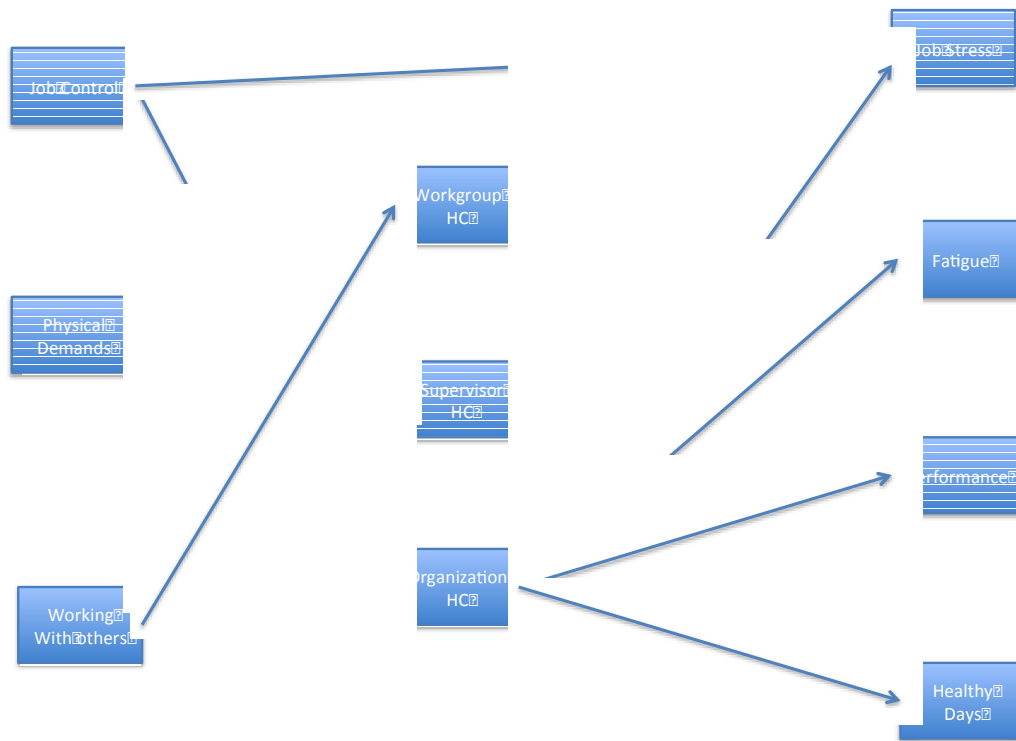


Figure 11  
Study 3 Final SEM Model





Appendix A  
Survey Items

**Study 1**

**MOHCA**

1. If my health were to decline, my coworkers would take steps to support my recovery.
2. In my workgroup, use of sick days for illness or mental health issues is supported and encouraged.
3. My supervisor sets performance norms that are in conflict with health behaviors.
4. My supervisor encourages participation in organizational programs that promote employee health and well-being.
5. My supervisor encourages healthy behaviors in my workgroup.
6. My organization is committed to employee health and well-being.
7. My organization provides me with opportunities and resources to be healthy.
8. When management learns that something about our work or the workplace is having an effect on employee health or well-being, then something is done about it.
9. My organization encourages me to speak up about issues and priorities regarding employee health and well-being.

**Behavioral Intentions**

*Indicate how ready you are to make the changes or improvements in your health in the following areas:*

1. Be physically active
2. Practice good eating habits.
3. Avoid smoking or using tobacco.
4. Lost weight, or maintain healthy weight.
5. handle stress well.
6. Avoid alcohol or drink in moderation.
7. Live an overall healthy lifestyle.

**Work-SOC**

*To what extent do you agree with the following statements about your job?*

1. manageable (7)- unmanageable (1)
2. meaningless (7)- meaningful (1)
3. structured (7)- unstructured (1)
4. easy-to-influence (7) - impossible-to-influence (1)
5. insignificant (7) - significant (1)
6. clear (7) - unclear (1)
7. controllable (7) - uncontrollable (1)
8. unrewarding (7) - rewarding (1)
9. predictable (7) - unpredictable (1)

**Burnout**

1. More and more often I talk about my work in a negative way.
2. Sometimes I feel really disgusted with my work.
3. After work, I have enough energy for leisure activities.
4. At work, I usually feel worn out and weary.

## Appendix A Cont.

### **Stress**

*What is your JOB like MOST OF THE TIME? For each work or phrase, mark "yes" if the word describes your job, "no" if it doesn't, and "?" if you can't decide.*

In general, I think my job is...

1. Irritating
2. Pressured
3. Hectic
4. More stressful than I'd like
5. Hassled
6. Has many things that are stressful

### **Depression**

*Please indicate how often you have felt this way during the past week by checking the appropriate box for each question.*

1. I was bothered by things that usually don't bother me
2. I had trouble keeping my mind on what I was doing.
3. I felt depressed.
4. I felt that everything I did was an effort.
5. I felt hopeful about the future (R)
6. I felt fearful
7. My sleep was restless
8. I felt happy (R)
9. I felt lonely
10. I could not "get going".

### **Civility Norms**

At the department of corrections...

1. Rude behavior is not accepted by my coworkers
2. Angry outbursts are not tolerated by anyone in my unit/workgroup
3. Respectful treatment is the norm in my unit/workgroup
4. My coworkers make sure everyone in my unit/workgroup is treated with respect.

### **Work Ability**

*For the following questions, please think about your work on YOUR CURRENT MAIN JOB. Assume that your work ability at its best has a value of 10 points (0=you cannot work at all; 10= your work ability is currently at its best).*

1. How many points would you give your CURRENT ABILITY TO WORK?
2. Thinking about the PHYSICAL DEMANDS of your job, how do you rate your current ability to meet those demands?
3. Thinking about the MENTAL DEMANDS of your job, how do you rate your current ability to meet those demands?

Thinking about the INTERPERSONAL DEMANDS of your job, how do you rate your current ability to meet those demands?

## Appendix A Cont.

### **Performance**

*How do you feel your performance is viewed by the SUPERVISOR who covers your functional unit and has some input or influence over your evaluation? What does your clinical supervisor (i.e., not you) think of...*

1. ...the quality of your work?
2. ...the quality of your interactions with coworkers?
3. ...the quality of your interactions with patients?
4. ...your overall work performance?

### **Engagement**

*The following statements refer to YOU AND YOUR WORK EXPERIENCES. Please rate the extent to which you agree or disagree with each of the following statements.*

1. When I get up in the morning, I feel like going to work.
2. I find the work that I do full of meaning and purpose.
3. Time flies when I'm working.
4. My job inspires me.
5. I feel happy when I am working intensely.
6. I am proud of the work that I do.
7. I am immersed in my work.
8. I get carried away when I'm working and lose all track of time.
9. I am enthusiastic about my job.
10. At my job, I feel very energetic.

### **OCB-E**

*The following statements refer to YOU AND YOUR WORK EXPERIENCES. Please rate the extent to which you agree or disagree with each of the following statements.*

1. I take a personal interest in the well-being of others (e.g., help new employees)
2. I pass along work-related information to others.

### **Healthy Days**

1. Would you say that in general your health is excellent, very good, fair, or poor?

### **Fatigue**

*During the past six months have you...*

1. Had problems with tiredness?
  2. Had problems thinking clearly?
  3. Felt sleepy or drowsy during the day?
-