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To the Graduate Council:

I am submitting herewith a dissertation written by Anthony Jeffery Depietro entitled "Safety Climate Perceptions of Contingent and Permanent Employees Associated with the Manufacturing of Office Products." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Health and Human Sciences.

Gregory G. Petty, Major Professor

We have read this dissertation and recommend its acceptance:

June Gorski, Charles Hamilton, Ernest Brewer

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

Safety Climate Perceptions of Contingent and Permanent Employees Associated with the Manufacturing of Office Products

Dissertation Presented for
the Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Anthony Jeffery DePietro
May 2012

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DEDICATION

The following dissertation is dedicated to my mother, Denise DePietro.

ACKNOWLEDGMENTS

I would like to thank my family and friends for all of their support throughout this process. To my father thank you for your support and encouragement to ensure that I completed my degree.

I would like to thank my committee members for their hard work to ensure that I completed this enormous task. I would like to first thank Dr. Gregory C. Petty, Professor of Public Health for being my dissertation committee chair. The amount of thanks cannot be expressed in words. I would also like to thanks Dr. June D. Gorski, Professor of Public Health, Dr. Ernest W. Brewer, Professor of Educational Leadership and Policy Studies, and Dr. Charles B. Hamilton, Professor of Public Health for their assistance with this process.

I would also like to thank all the employees of Newell-Rubbermaid. Without their cooperation, this study would not have been completed. Lastly, I offer my regards and thanks to all of those who supported me in any respect during the completion of the project.

Abstract

The purpose of this study was to investigate if there were differences in the perceived safety climate experienced by contingent employees as compared to the perceptions of permanent workers' safety climate. Knowledge of these differences will help safety professionals provide better safety training and working conditions for contingent workers. Safety climate is defined as employees' perceptions of safety polices, procedures, and practices (Kath, Marks, & Ranney, 2010). The population for the study included employees who work for a manufacturer of office products located in Tennessee. A total of 813 employees participated in the study with a response rate of 87% of the total population of 973 employees. The data was collected using a census. Participants solicited for this study included contingent and permanent employees of three facilities. Data were collected using the Hall Safety Climate Instrument. Data were entered into a Statistical Package for Social Sciences (SPSS), version 20.0. Items stated in reverse order were coded to result in a higher score for each item, consistent with a more positive safety climate. Climate was measured using *t*-tests and analysis of variance (ANOVA). A mean of 1 to 3.4 is considered negative and a mean of 3.5 to 5 is considered positive. The study found that there was significant difference between the safety climate perceptions of contingent and permanent employees. There was no significance between the safety climate themes that were measured by the Hall Safety Climate Instrument. There were significant differences in factors that included: education, gender, length of employment, and department where employee works.

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CHAPTER I

INTRODUCTION TO THE RESEARCH STUDY

The purpose of this chapter is to provide the formulation and definition of the problem. This chapter includes the following: (a) statement of problem, (b) significance of study, (c) purpose of the study, (d) research questions, (e) assumptions, (f) limitations, and (g) delimitations of the study.

Hazards in the workplace continue to be a serious problem for American industry (National Safety Council, 2011). This problem has been particularly true for the contingent workforce (Benavides et al., 2006; Virtanen et al., 2005). Two studies revealed that contingent workers had higher risks of occupational injuries than permanent workers (Benavides et al., 2006; Virtanen et al., 2005). According to the Bureau of Labor Statistics (BLS), a total of 4,547 fatal workplace injuries were recorded in private industry workplaces during 2010 (BLS, 2011). The BLS further reported a total of 3.6 million nonfatal injuries and illnesses, of which approximately 933,200 cases were severe injuries that required time away from work (BLS, 2011). On an average day in 2010, 12 workers were killed and 9,863 were injured. Among those injured, 2,556 were severely injured (BLS, 2011).

These statistics are concerning, especially since the BLS has been known to under estimate injuries associated with injury (Probst & Estrada, 2010). These data illustrate the continuing need to identify ways to reduce workplace hazards and injuries and to improve overall workplace safety, especially with the understudied contingent workforce. Contingent workers are often subjected to hazardous jobs and tasks and may be less likely to recognize and report hazards and injuries (CDC, 2002; Park & Butler, 2001).

Hazards and unsafe behaviors in the workplace continue to be a serious problem in the manufacturing of office products. According to the Bureau of Labor Statistics (BLS, 2011), approximately 5,300 employees are employed by the office products industry in the United States, and one-third of those employees work in the state of Tennessee. In 2010, 3 out of every 100 manufacturing employees in office products were injured on the job in the United States (BLS, 2011).

Organizational and operational practices have changed dramatically in American manufacturing in recent years due to the competitive nature of business forced by the ever-changing uncertain economy. To be more competitive, many companies have restructured themselves, downsized their work force, and increased their number of contingent workers (CDC, 2002; Koukoulaki, 2010). This restructuring is common in the manufacturing of office products due to seasonal demand. In Tennessee, a typical office product manufacturer uses hundreds of contingent workers, also known as temporary workers, to balance the forces of change in the economy.

The dramatic and rapid changes in operational practices that have occurred in the workplace have outpaced the understanding of the implications for safety and health on the job (CDC, 2002; Koukoulaki, 2010; Quinlan & Bohle, 2009). In an attempt to improve safety, experts have explored organizational and psychological factors affecting workers in the workplace, including safety (Luria, 2010; Zohar, 1980; Zohar, 2009).

The safety profession has changed with a focus on the leading indicators of safety incidents rather than on the lagging indicators (Flin, Mearns, O'Conner, & Bryden, 2000; Oien, Utne, & Herrera, 2011). This shift in focus has been driven by the idea that human factors, rather than mere technical failures, are the cause of hazards and injuries in industry (Flin et al., 2000).

A common way to measure leading indicators of safety incidents is by studying the safety climate of the physical location (Zohar, 2009). Typically, climate studies have been conducted with the permanent workers employed in high-risk occupations, including steel mills, oil platforms, and chemical factories (Zohar, 2009). More recently there has been a recognized need to study the contingent workforce (Baek, Bae, Ham, & Singh, 2008; Luria & Yagil, 2010), a group that is increasing in number each year. Of particular interest is the safety climate as perceived by the contingent workers.

Safety climate is defined as employees' perceptions of safety polices, procedures, and practices (Kath, Marks, & Ranney, 2010). Safety climate is an organizational factor commonly cited as an important precursor of safety in the workplace (Zohar, 2009). Different themes of safety climate have been discussed for years (Kath et al., 2010; Kines et al., 2011). To identify the differences among contingent workers and permanent workers, seven themes were used. These included: management/supervisor attitude toward safety; safety management; risk; work pressure; competence; group norms; and the intention to follow safety procedures. These themes are based on the Hall Safety Climate Instrument (Appendix C). These themes are supported by Flin in a study he conducted identifying common features of safety climate studies (Flin et al., 2000).

Statement of the Problem

The number of contingent positions has increased tremendously in recent years, which has in turn led to an increase in contingent workers. With this increase in contingent workers, there has been an increase in the amount of injuries suffered by contingent workers (Benavides et al., 2006; Cummings & Kreiss, 2008; Koukoulaki, 2010; Luria & Yagil, 2010; Park & Butler, 2001; Smith, Silverstein, Bonauto, Adam, & Fan, 2010; Virtanen et al., 2005). Additionally,

contingent workers have an equal, and possibly increased, chance of being injured on the job because of their limited training and lack of knowledge of the job (Clarke, 2006; Park & Butler, 2001).

Purpose of the Study

The purpose of this study was to investigate if there are differences in the perceived safety climate experienced by contingent as compared to the perceptions of permanent workers' safety climate in the manufacturing of office products. Knowledge of these differences (if any) could help safety professionals provide better safety training and working conditions for contingent workers.

Research Questions

In conducting the study, the researcher answered the following research questions. The research questions for this study include the following:

1. Does the contingent workers' perception of safety climate differ significantly from the perception of permanent employees, as measured by the Hall Safety Climate Instrument?
2. How do self-reported safety climate themes, as measured by the Hall Safety Climate Instrument, differ significantly between contingent and permanent employees?
3. Does safety climate, as measured by the Hall Safety Climate Instrument, differ significantly between contingent and permanent employees who self-reported a safety hazard if aware of a hazard?
4. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by one's level of education?

5. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by one's gender?
6. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by one's age?
7. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by length of employment?
8. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by job position: "Assembly," "Dispatcher," "Maintenance," "Material Handler," "Packaging," "Molding," "Office," "Order Processor," or "Warehouse Driver"?

Significance of the Study

A literature review shows that multiple studies have been conducted on safety climate (Luria & Yagil, 2010; Zohar, 2009). Typically these studies were conducted in hazardous industries including steel mills, nuclear facilities, and construction. A majority of these studies were conducted on permanent employees. This study will focus on a heretofore little studied but growing component of the workforce, the contingent worker. Previous research has revealed that there is an increase in the amount of injures within the contingent workforce (Benavides et al., 2006; Cummings & Kreiss, 2008; Koukoulaki, 2010; Luria & Yagil, 2010; Park & Butler, 2001; Smith et al., 2010; Virtanen et al., 2005). However, these previous studies with contingent workers have not focused on the safety climate as a mitigating factor in the increase in number of injuries.

While studies among contingent and permanent workers have been conducted, these reveal conflicting results in safety climate research among contingent and permanent employees (Clarke, 2003; Cox, Tomas, Cheyne, & Oliver, 1998; Luria & Yagil, 2010). It is expected that

this current study will add to the body of literature in the study of contingent employees and help researchers and safety managers understand important differences and similarities between contingent and permanent employees. According to Baek et al., (2008) "there is a need of further study of safety climate among contingent and permanent employees which includes affecting variables such as age, gender, work area, etc." (Baek et al., 2008, p. 52).

Assumptions of the Study

In conducting this study, the researcher made the following assumptions.

1. The Hall Safety Climate Instrument is a valid and reliable instrument for measuring safety climate among workers at office product facilities in Tennessee.
2. Participants completed the survey honestly and to the best of their ability.
3. Participants completed the survey without coercion.
4. A mean of 1 to 3.4 is considered negative and a mean of 3.5 to 5 is considered positive.
4. Perceived safety climate is related to the number of injuries suffered by workers.

Limitations of the Study

In conducting this study, the researcher identified the following limitations.

1. The study is limited to self-reported data.
2. The analyzed data are limited to office products employees who voluntarily completed the Hall Safety Climate Instrument.
3. There was no control over the number of employees who completed the survey.

Delimitations of the Study

In conducting this study, the researcher identified these delimitations. The study will include the following delimitations:

1. The data were delimited to employees of one manufacturing company at three locations in Tennessee.

2. Generalizations of this study beyond Tennessee are limited to a population of employees working at office product facilities in Tennessee.

Operational Definitions

To facilitate understanding of the terms used in this study, the following definitions have been provided. The researcher has used each term consistently throughout the study.

1. *Assembly* – Department where employees assemble markers.
2. *Competence* – Self-efficacy to follow safety procedures (Hall, 2006)
3. *Contingent Workers* – Contingent workers are those who do not have an implicit or explicit contract for ongoing employment. Persons who do not expect to continue in their jobs for personal reasons such as retirement or returning to school are not considered contingent workers, provided that they would have the option of continuing in the job were it not for these reasons.
4. *Dispatcher* – Employee that creates work orders.
5. *Group Norms* – Group climate influences an individual's safety choices (Hall, 2006).
6. *Hall Safety Climate Instrument* – The Hall Safety Climate Instrument was designed, piloted, and field-tested to be used to assess employee safety climate. The instrument consists of 34 items that were determined as valid and reliable from the testing conducted by Hall (2006).
7. *Lagging indicators* – Lagging indicators are after-the-fact measurements that gauge past performance, such as OSHA incidence rates, injury and incident costs.

8. *Leading indicators* – Leading indicators attempt to measure performance by using tools such as job safety analyses and job observations.
9. *Maintenance* – Employees that repair machines.
10. *Material Handler* – Employee that moves raw material to production lines.
11. *Management commitment* – When managers demonstrate strong, genuine, continuous, and personal commitment to safety (Czerniak & Ostrander, 2005).
12. *Molding* – Area of facility that produces plastic components that are assembled into finish markers.
13. *Occupational safety system management* – system comprises a set of policies and practices aimed at positively impacting on the employees' attitudes and behaviors with regards to risk (Bottani, Monica, & Vignali, 2009).
14. *Office* – Employees that work in the office area, not in production.
15. *Office products* – This United States industry comprises establishments primarily engaged in manufacturing pens, ballpoint pen refills and cartridges, mechanical pencils and felt tipped markers.
16. *Order Processor* – Employees that fill orders in the distribution center
17. *Packaging* – Employees that pack finish markers and pencils into packaging for sale at stores.
18. *Permanent workers* – Full time employees of host employer.
19. *Risk* – Individual's assessment of danger (Hall, 2006).
20. *Safety climate* – Safety climate is defined as employees' perceptions pertaining to safety policies, procedures, and practices (Kath et al., 2010).
21. *Warehouse Drive* – Employees that move finish goods in the distribution center.

22. Work pressure – Individual's perceived priority of work vs. safety as set by others (Hall, 2006).

Summary of Chapter I

This chapter provided an introduction, a statement of the problem, the significance of the study, the purpose of the study, research question, assumptions, delimitations and limitations, and a definition of terms. Chapter II will discuss research pertaining to the contingent workforce, safety climate, and themes included in safety climate.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to present a comprehensive review of the literature related to the safety climate of contingent and permanent worker safety. The review of literature includes contingent workers, contingent worker safety and public health, office product manufacturing, safety themes that make up safety climate, previous studies.

Workplace hazards continue to be a major concern in the United States and other developed nations. Although the numbers of injuries and deaths have decreased over the years (BLS, 2011; Eurostat, 2010), additional focus in the area of safety climate needs to be implemented in order to eliminate injuries.

Contingent Workers

Employment arrangements where the employee has a nontraditional relationship with the worksite employer have come to be known as contingent work in the last few years (Cummings & Kreiss, 2008; Redpath, Hurst, & Devine, 2007). Through the 1970s and 1980s, contingent employment hiring practices became more common in the United States so employers would be able to flex their workforce with the changes in production or economy (Cummings & Kreiss, 2008). From 1969 to 1993, the number of contingent workers nearly doubled, representing a quarter of all growth in jobs in the national workforce (Cummings & Kreiss, 2008). From 1982 to 1990, employment in contingent workforce increased 10 times faster than did the workforce as a whole (Cummings & Kreiss, 2008; Freeman & Gonos, 2011). Since national data were first collected by the United States Department of Labor in 1995, contingent workers have consistently represented nearly one-third of the total workforce, reaching 43 million in 2005 (Cummings & Kreiss, 2008). In 2010 27% of the jobs created were for the contingent population

(Freeman & Gonos, 2011). Contingent work is so common that 90% of American businesses use contingent workers (Freeman & Gonos, 2011). The contingent workforce has been increasing the greatest in the lower wage sector (Freeman & Gonos, 2011). "In 1985, blue collar temp constituted only 6% of the temp agency workforce; by 1997, they accounted for approximately 30% of the temporary staffing workforce and make up over 35% of the temporary workforce today" (Freeman & Gonos, 2011, p. 10). Contingent work has increased in the United States, bringing with it implications for health and safety (CDC, 2002; Freeman & Gonos, 2011; Koukoulaki, 2010).

Contingent Worker Safety and Public Health

Over the last decade the global market has become more aggressive and organizations have increased their flexibility with labor to be more competitive (Waenerlund, Virtanen, & Hammarstrom, 2011). Contingent employees have an increased chance of being injured on the job (Benavides et al., 2006; Cummings & Kreiss, 2008; Koukoulaki, 2010; Luria & Yagil, 2010; Park & Butler, 2001; Smith et al., 2010; Virtanen et al., 2005). Contingent employees have a three times higher injury frequency than permanent employee (Koukoulaki, 2010). Research has shown that this increased chance of injury is due to exposure to more hazardous job conditions, less job experience, lack of safety training, and lack of familiarity at the worksite (Benavides et al., 2006; Koukoulaki, 2010). Another study found that contingent workers are sometimes paid by pieces completed. This type of work can cause the employee to be in a rush to complete the work. This increased speed can lead to increased injuries (Koukoulaki, 2010).

"In some cases, contingent arrangements represent the outsourcing of more high-risk jobs, so that a greater burden of injury, illness, and fatality is carried by contingent workers than by permanent employees" (Cummings & Kreiss, 2008, p.449). Contingent workers are involved

with hazardous work for multiple reasons. Explanation about safety policies and practices may be known to the permanent employees but not to the contingent worker; therefore, the employer or permanent employees may take advantage of contingent workers' lack of training by placing them in more hazardous working areas. Research shows that contingent workers receive less safety supervision and training are less likely to participate in a safety and health committee, as well as safety discussions (Park & Butler, 2001). Research suggests that contingent workers' risk takes two forms, behavioral risk and hazard severity risk (Benavides et al., 2006; Cummings & Kreiss, 2008; Park & Butler, 2001).

Due to contingent workers' inexperience with the job task, it is possible to endanger other employees' safety and health. The staffing service focuses more on administrative tasks and is generally not involved in training or worksite inspection; therefore, they are unaware of the hazards employees face (Park & Butler, 2001). This contingent work relationship makes safety management difficult. For example, the employer that oversees the contingent workers is typically responsible for compliance, but the staffing services provide workers' compensation benefits (Park & Butler, 2001). The staffing service pays for workers' compensation costs but is not able to monitor safety hazards at the facility effectively (Park & Butler, 2001).

A study conducted by Waenerlund et al., (2011) found that contingent employment was related to poor health status. There are multiple reasons that could explain health differences between permanent and contingent employees. One reason is job insecurity (Waenerlund et al., 2011). This has been associated with reduction in psychological health. Another reason is financial instability. This instability can increase health risks (Waenerlund et al., 2011).

Only 13% of contingent workers had health insurance provided by their employer, compared with 72% of permanent workers (Cummings & Kreiss, 2008). According to

Cummings & Kreiss (2008), a Finnish study found that contingent employment was associated with 1.2 to 1.6 times higher causes of mortality compared with permanent employment, and that workers who moved from contingent to permanent employment had lower mortality than those who remained in contingent employment during the study period (Cummings & Kreiss, 2008). "Higher cause-specific mortality was observed for alcohol-related causes and smoking-related cancer, raising questions about the psychological effects of contingent arrangements" (Cummings & Kreiss, 2008, p.449). A meta-analysis of nine European studies found that contingent workers had significantly higher odds of psychological distress than permanent workers odds ratio, 1.25 (Cummings & Kreiss, 2008). However, there is potential for positive results.

Contingent work allows the employee to control one's work time, sample a variety of work experiences, and use the contingent status as a way to permanent employment (Virtanen et al., 2005). Research shows that the health effects of contingent employment may be outcome specific and that the work conditions and health of contingent employees may depend on the social and environmental context (Virtanen et al., 2005).

In the countries that make up the EU27, which is an economic and political group of countries primarily in Europe, their injury results in 2007 were, 3.2% or 6.9 million people of 15-64 years that worked or had worked during the past year had one or more incidents at work in the past 12 months (Eurostat, 2010). According to Engineering Societies in the Agents World (ESAW), 5,580 workers in the EU27 died in a fatal accident at work in 2007 and approximately 2.9% of workers had an accident at work resulting in more than 3 days away from work (Eurostat, 2010). A study in Spain found that contingent employees had more than two times the rate of fatal and nonfatal occupational injuries than permanent employees (Cummings & Kreiss,

2008). A study conducted between 1995 and 2000 of more than 15,000 European workers concluded that contingent workers tend to report higher levels of work-related fatigue, backache, and muscular pain than permanent workers (Cummings & Kresiss, 2008). A Scandinavian study from 1995 to 1996 showed a ten to fifteen percent higher rate of incidents for contingent employees than permanent employees (Koukoulaki, 2010). Also a study in 2006 that was conducted in Italy showed that work related incidents were higher among contingent workers than permanent employees (Koukoulaki, 2010).

India is an emerging country for goods-producing manufacturing (Thomas, 2010). Thomas (2010) states that one-fourth of employees in India have had a work-related illness during their career. India has had safety regulation for years but is limited to 1,400 safety compliance officers, 1,154 factory inspectors, and 27 medical inspectors (Thomas, 2010). These numbers are inadequate even for the inspection of formal units that only employ about 10% of India's total workforce (around 26 million), let alone the millions who work in the informal sector with absolutely no safeguards. A study in India found that accident incidence rate, accident frequency rate, and accident severity rate were found to be significantly higher in contingent workers (Koukoulaki, 2010).

Occupational safety has been another serious problem during the transition of China's economy. China's incident rate has increased in the past ten years (Zhu, Fan, Fu, & Clissold, 2010). In 2006, China had a total of 14,382 fatalities (Zhu et al., 2010), that is ~10,000 more fatalities than the United States. China's economic development over the last three decades has not been matched by an equal development of their safety policies (Zhu et al., 2010).

A study of nurses caring for hospitalized patients in 11 U.S. cities found that contingent nurses had a needle-stick injury rate 1.65 times higher than that of permanent nurses working in the same hospitals (Cummings & Kreiss, 2008; Koukoulaki, 2010).

A study in 2004 showed that 19% of contingent employees in the construction industry reported a work-related injury compared to six percent of permanent employees (Koukoulaki, 2010). In the United States, it is common that contingent employees earn less than permanent employees and contingent workers will typically have two jobs. This type of behavior can increase the chance of incident (Koukoulaki, 2010). The reason for this is that the employee does not have enough time to rest and the potential for injury can increase.

Office Products Manufacturing

In North America, pen and mechanical pencil manufacturing is listed under the NCIAS code of 339941. This code is used to track the injury data for office product manufacturing. For the purpose of this study, this group will be used to represent office products manufacturing workers. According to BLS, pen and mechanical pencil manufacturing is below the national average for nonfatal occupational injury and illness incidence rates (BLS, 2011).

In the United States, goods-producing industries as a whole accounted for approximately 36.3% of all occupational illness cases (BLS, 2011). The manufacturing sector accounted for nearly 32 percent of all occupational illness cases and reported a 3.2 incident rate in 2010 compared to a 2.9 incident rate in 2009 (BLS, 2011).

The BLS injury and illness rates for Tennessee have shown a steady decline. The 2010 total case rate for the private sector was 3.6, a 14.3% reduction over the 2009 rate and a 20% reduction from the 2008 rate. The national total case rate in 2009 was 3.9. The 2010 Days Away

Restricted and Transferred (DART) rate was 1.9, a 9.5% reduction over the 2008 rate and a 13.6 reduction from 2008. The national DART rate for 2010 was 1.8 (BLS, 2011).

Safety Climate

The term safety climate is related to the research of safety culture. The idea of a safety culture is derived from the research of organizational culture and climate, where culture embodies values, beliefs, and underlying assumptions, and climate is a descriptive measure reflecting the workforce's perceptions of the organizational atmosphere (Flin et al., 2000). The term safety culture first made its appearance in the 1987 OECD Nuclear Agency report on the 1986 Chernobyl disaster (Cooper, 2000). A positive safety culture is used to describe the corporate atmosphere or culture in which safety is understood to be and is accepted as the number one priority (Cooper, 2000). Safety climate is defined as employees' perceptions pertaining to safety policies, procedures, and practices (Kath et al., 2010).

The 1980s represented a shift in focus regarding safety science theory and practice, from technical and human factors to management and organizational aspects of safety promotion (Lund & Hovden, 2003). The shift in focus was driven by awareness that organizational, managerial, and human factors had a larger effect on causes of incidents than just technical failures (Flin et al., 2000). Successful operations require a culture of reliability centering on safety (Singer et al., 2007). When safety perceptions are positive, greater chance exists that an individual will perform safe acts (Clarke, 2006). These positive safety perceptions lead to a positive safety climate, thereby reducing the number of incidents (Clarke, 2006). Safety culture can be defined as a sub-component of corporate culture. Safety culture incorporates the individual, job, and organizational features that can both positively and negatively effect and influence overall health and safety (Andi, 2008).

Organizational characteristics and behaviors are important factors in the root cause analysis of incidents. When considering safety and safety-related behaviors, organizational climate has been widely considered to be an important variable. Additionally, safety climate includes important safety-related variables such as training, management organization, management attitudes toward safety, the effect of safety practices on promotion, supervisors' behaviors, safety equipment, perceived likelihood of injury, and priority given to safety by management (Tomas, Melia, & Oliver, 1999).

Behavioral Science Technology, Incorporated conducted a group study of companies that implemented behavior-based safety. When separating the best from the best and the worst from the worst, the company's culture was the separating factor (Heston, 2006). This is an important idea to understand. The safety climate is critical to injury prevention. If a location implements necessary safety polices and procedures but does not have the proper safety climate employees will still make unsafe decisions that could lead to incidents. With an adequate safety climate employees will understand the risks and make the safe choice. The leadership of the company drives the climate.

Management Attitude toward Safety

An attitude is an outlook that one takes, either positively or negatively, toward a person, object, or event (Ajzen, 1988). Management safety attitudes are defined as workers' perceptions of management's awareness of safety issues and willingness to invest valuable resources to address them (Zohar, 1980). If an employee does not believe that management is concerned with their safety than the employee is less likely to perceive safety as a concern (Fogarty & Shaw, 2010). This is important in locations with high numbers of contingent employees because as

stated by Luria and Yagil (2010) contingent employees have a harder time becoming part of the safety climate.

Perceptions of management's commitment and priority to safety have been found to be the most commonly assessed themes in safety climate research (Flin et al., 2000). If management supports safety procedures and is willing to invest in employees' safety, the employees are likely to feel more comfortable discussing safety-related issues with their supervisors. On the other hand, when management has negative attitudes or views about safety procedures and does not support the practice of safe behaviors, then employees will feel less comfortable confiding in their supervisors about safety-related issues in the organization (Kath et al., 2010).

Studies of safety climate have shown that where safety is a goal for managers and front line leaders, and where a good interaction exists between managers and employees, employees of that organization are less likely to be involved in a safety- related incident (Luria, 2010). Zohar (1980) found that an employee's perception of his or her manager's attitudes toward safety practices was the most important factor in safety climate.

Occupational Safety System Management

Safety management contains multiple elements. According to Czerniak and Ostrander (2005) safety management contains nine key elements. These elements include: management leadership and commitment, organization communications and documentation, assessments, hazard recognition, workplace design, operational programs, employee involvement, behaviors and attitudes, and training. These elements define a management system that is complex. These elements are all important and occupational safety system management plays an important role in safety climate. The management system is the compliance piece of the overall program.

Failure of safety management systems can contribute to industrial safety incidents (Vinodkumar & Bhasi, 2010). "A safety management system reflects the organization's commitment to safety, and it has an important influence on employees' perceptions about the importance of safety in the company" (Vinodkumar & Bhasi, 2010 p. 2083). Areas of safety management that are important according to literature review are high status of safety manager, frequent safety audits, and strong safety training (Kines et al., 2011; Vinodkumar & Bhasi, 2010; Zohar, 1980). Though management systems are important, safety behavior plays an important role in incident prevention. Employees understanding of risk, group norms, and employees intention to follow safety policies are also important. These areas can be challenging for contingent workers because of a lack of understanding of their current employer's safety climate (Luria & Yagil, 2010)

Risk Behavior

According to Cooper (2003), risk refers to the possibility of harm or loss presented by the existence of perceived threats within a particular situation. When a person senses danger, he or she either faces it or avoids it. Some perceive danger in every situation, while others don't see danger at all. As a result, some have the propensity to take risk, while others have a greater tendency to avoid risks. The real risk associated with a particular hazard or behavior is determined by the magnitude of loss if a mishap occurs and the probability that the loss will indeed occur (Geller, 2001). If an individual or employee does not believe there is a risk related to the task that he or she is participating in, then the risk willing to be taken will increase. This can be a challenge for contingent workers because of their lack of training and understanding of safety policies (Luria & Yagil, 2010).

In most situations, natural tendencies work against safety. The safe behavior is typically less comfortable, convenient, or efficient than an at-risk alternative (Geller, 2000; Luria, 2010). Safe behavior is thus an on going managerial challenge (Luria, 2010). In many cultures, interpersonal consequences of reporting a hazard are perceived as more negative. For example workers may be harassed for wearing personal protective equipment (PPE) or for using proper guarding on a machine, while some may consider it bad to work unprotected and take risks.

Studies show the importance risk plays in injury prevention. Previous studies have shown that workers have accurate perceptions of their risk but continue the unsafe act (Flin et al., 2000). According to Brown, Willis, and Prussia (2000), "employee's attitudes and behaviors are the most important antecedents to unsafe acts and incidents". Based on research by Bigos and Komaki, employees who have the worst attitudes are the most likely to have unsafe incidents (Brown et al., 2000).

Work Pressure

Data suggest that the average work year for working couples at their prime age has increased by nearly 700 hours in the last two decades and that high levels of emotional exhaustion at the workday are the norm for 25% to 30% of the workforce (CDC, 2002). Factors related to work pace and workload appears in a number of instruments (Flin et al., 2000).

Workplace pressures are elements beyond the control of the individual worker and impact one's perceived ability to complete tasks in accordance with procedures (Fogarty & Shaw, 2010). Workplace pressures include lack of equipment, lack of personnel, lack of time, and production pressures. In today's global economy, the pressure to produce a product as efficiently as possible is a top priority for all companies (Flin et al., 2000). This theme is important to study because in many industries contingent employees' work is based on piece rates. When

employees are paid by the amount of product that is assembled increased pressure can occur (Koukoulaki, 2010). This factor demonstrates the importance of this theme in the overall assessment of safety climate (Flin et al., 2000). Having a good safety climate will help drive employees to work safety even with the increased pressure to produce quality products on time with fewer resources.

Competence

The perception of the hourly work force qualifications, skills, and knowledge is the purpose of this theme, with associated aspects relating to selection, training, competence, and their assessment (Flin et al., 2000). This also is likely to be influenced by economic conditions and training budgets (Flin et al., 2000). For these reasons this theme is important to this study because data show that contingent workers' higher number of injuries can be attributed to lack of experience and safety training (Benavides et al., 2006; Virtanen et al., 2005).

Group Norms

Individual attitudes and practices are important to a positive safety climate. To shape these individual attitudes the group as a whole plays an important part (Tomas et al., 1999). When the group has a positive safety climate new and future employees will be more likely to adapt that safety climate (Beus, Payne, Bergman, & Arthur, 2010). This is important in locations with high levels of contingent employees because as contingent employees join the location a strong group safety climate will be more likely to influence these employees' safety decisions. These shared perceptions of safety being valued and expected in the organization would also contribute to the development of workgroup norms favoring safety (Kines et al., 2011).

Intention to follow Safety Procedures

The theme of intention is based on the idea of a worker's intention to follow safety polices and procedures. There are reasons why an employee may or may not follow a safety policy. An employee may not follow a safety policy because it is unknown or the employee may choose not to follow the policy under one's own determination. Luria and Yagil (2010) stated that contingent employees may have lower organizational commitment and the results can be lower involvement in organizational activities and following safety policies. Contingent employees are less committed to safety beyond their own tasks and have less trust in organizational safety policies because they have less ownership (Luria & Yagil, 2010).

Hall added the seventh theme of intention, a variable needed to fulfill the Hall Pathway Model derived from the theory of planned behavior. This theme was also supported by Fogarty and Shaw (2010) who found that an intention variable was needed to fulfill the requirements of the theory of planned behavior when used to model safety climate.

Previous Safety Climate Studies

Currently 130 studies have been published on safety climate from 1980 through 2008 (Zohar, 2009). The results of these safety climate studies are inconclusive. Studies vary in the number of factors identified. DeDobbeleer and Beland (1991) identified two factors, whereas Lee (1998) found 38 factors initially and then reduced them to 15. Most studies have been new research and few have replicated previous studies (Cai, 2005). In the few studies that have been replicated, the results could not confirm the original study (Cai, 2005). The studies conducted on safety climate include Zohar (1980), where he identified eight factors of the safety climate in 16 production factories throughout Israel. Brown and Holmes (1986) used Zohar's questionnaire in

10 United States manufacturing and production companies and determined that safety climate included three significant factors. In replicating the Brown and Holmes study DeDobbeleer and Beland (1991) used the same questionnaire in nine United States construction sites and came up with only two factors.

In a study conducted in 2007 at a coal mining company in China, researchers examined the attitudes toward occupational safety and the impact of the safety climate of coal miners (Zhu et al., 2010). The research was conducted using an instrument that used the Likert scale. The researchers distributed the instrument at the beginning of the shift, and the employees completed the instrument before starting work (Zhu et al., 2010). A total of 209 surveys were completed with a return rate of 89 percent (Zhu et al., 2010). The results of this study supported two of the themes used in the Hall Safety Climate Instrument. These themes were management commitment and safety knowledge (Hall, 2006; Zhu et al., 2010).

Limited empirical evidence exists to suggest that contingent workers will have less positive attitudes towards safety than their permanently employed co-workers. A study by Cox et al., (1998) examined the safety attitudes of manufacturing workers. The sample was 2,719 permanent workers and 172 temporary workers. The study found that the contingent workers had significantly more negative safety attitudes in regards to safety commitment.

Summary of Chapter II

In summary, the literature reviewed previous studies and research that provided the background for this study. The literature review focused on current safety trends, previous studies in safety climate, contingent workers, and how contingent and permanent workers are affected by occupational injuries.

CHAPTER III

METHODOLOGY

The purpose of this chapter is to describe the methods and procedures used in the study to address instrument selection, the study population, administration of the instrument, the statistical design of the study, and analysis of the data collected. The methodology of the study was survey research. A census was used to collect the data from the different locations.

Instrumentation

Since Zohar (1980) published his study many researchers have completed studies in the area of safety climate. Regardless of how safety climate was defined, the primary research method used was the self-administered instrument (Cai, 2005). A review of relevant literature reveals that there are more than 20 empirically tested safety climate instruments for manufacturing and industry covering more than 50 different variables or conceptual themes (Zohar, 2009). Multiple safety climate instruments were reviewed for this study.

The Health and Safety Climate Survey Tool (CST) was published by the Health and Safety Executive in 1997. The CST included 71 items and featured 11 safety climate factors. The survey uses a five point Likert scale. Seo, Torabi, Blair, and Ellis (2004) developed an instrument that was composed of 32 items and 5 safety climate factors. The Seo et al. instrument was validated through the process of expert review as well as conducting a pilot test.

In a study conducted by Kines et al. (2011), the research team set out to develop a Nordic questionnaire for measuring safety climate (Kines et al., 2011). This questionnaire had both strong and negative aspects. The strong aspects included development based on theory and conducted across multiple locations. However, there were validity and reliability concerns (Kines et al., 2011). This questionnaire was not chosen because of its issues with reliability.

The instrument that was selected for this study was the Hall Safety Climate Instrument developed by Hall (2006) at The University of Tennessee, Knoxville. The instrument was designed to measure safety climate of an organization where employees are required to practice a high level of safety skills and to exhibit consistent high-safety behavior because of the level of risk associated with certain work-related tasks (Hall, 2006). This instrument measures safety climate. The Hall Safety Climate Instrument was designed, piloted, and field-tested to assess the employee safety climate (Hall, 2006). The instrument consists of 34 items that were determined as valid and reliable from the testing that was conducted by Hall (2006). A Likert scale is used to measure the responses of the subjects. The scale ranges from 1- *Strongly Disagree*, 2- *Disagree*, 3- *Neutral*, 4- *Agree*, and 5- *Strongly Agree*. The reliability of the Hall Safety Climate Instrument was established using Cronbach's alpha, exploratory factor analysis, and confirmatory factor analysis. The 34 items were checked for internal consistency by observing the overall Cronbach's alpha, .915 (n = 34). A factor analysis using principal component extraction with Varimax rotation was used to determine the underlying factor structure (Hall, 2006).

Specific Procedures

After obtaining approval from the Institutional Review Board (IRB) at the University of Tennessee, participants were solicited from the three office products facilities located in Tennessee. All participants were over the age of 18. The sample was obtained using a census sampling frame of employees working during the months of February and March 2011.

The study participants were all employees, including contingent employees, working at the locations. Eligible participants were those that attended safety meetings during the administration of the Hall Safety Climate Instrument. Those that were asked to participate

voluntarily include managers, supervisors, administrative, factory hourly, and contingent employees.

Subject Selection

The population for the study included employees who work for a manufacturer of office products located in Tennessee. The participants include employees working at three facilities; two are located in Shelbyville, Tennessee, and one in Maryville, Tennessee. Participants solicited for this study included managers, supervisors, support staff, hourly employees, and contingent employees at each of the three facilities. The total number of employees for each facility is displayed in Table 1. The Shelbyville Packing Center packages the final product for shipment to customers. The Shelbyville Distribution Center distributes final products to the customer and ships an estimated one billion dollars of office products annually. The Maryville Manufacturing Center manufactures components and assembles final products and manufactures an estimated three million finished markers daily.

Table 1: Locations and Populations

Location	Permanent Employees	Contingent Employees	Total Employees
Shelbyville Packaging Center Shelbyville, Tennessee	139	195	334
Shelbyville Distribution Center Shelbyville, Tennessee	118	82	200
Maryville Manufacturing Maryville, Tennessee	284	155	439
Total	541	432	973

Data Collection Methods

Pre-production meetings were held including employees at each of the locations to introduce and distribute Hall's Safety Climate Instrument. The instrument was introduced by the

researcher at each plant location during the pre-production meetings held for all departments. The break down of meetings is located in (Appendix A). A census was used for the collection of data. The instrument was administered at the beginning of each shift when the workers first returned to work for the week. The data was collected this way to ensure there was no contamination from employees previously completing the instrument. The meetings were started off by the supervisor of each shift and the researcher was introduced. The researcher utilized standard procedures provided in writing to introduce, administer, and collect permanent and contingent worker responses to the instrument. Procedures are located in (Appendix B). The researcher announced the anonymous survey and read a section, explaining how the contributions of the participants would provide information that will be used to measure safety climate. All workers attending each meeting were invited to participate voluntarily in the research by completing the survey. The researcher announced that it should take approximately 15 to 20 minutes to complete the survey. The instructions stressed that no identifying marks or numbers that might identify the individual were written on the surveys. Once the survey packets were distributed, the researcher displayed a box that was used to collect the survey packets. The researcher instructed respondents to place the packet received in the box, even if an individual worker chose not to complete the survey. The researcher picked one individual in each group to notify the researcher when all members of the group had placed their packets in the box, at which time the researcher entered the survey area and secured the box containing the surveys.

Analysis of Data

Data were entered into a Statistical Package for Social Sciences (SPSS), version 20.0. Items stated in reverse order were coded to result in a higher score for each item, consistent with a more positive safety climate. Climate was measured using *t*-tests and analysis of variance

(ANOVA). Table 2 shows what tests were used for each research question. A mean of 1 to 3.4 is considered negative and a mean of 3.5 to 5 is considered positive.

Table 2: Statistical Tests by Questions

Question	Test
1. Does the contingent workers perception of safety climate differ significantly than the perception of permanent employees, as measured by the Hall Safety Climate Instrument?	***t*-test**
2. How do self-reported safety climate themes, as measured by the Hall Safety Climate Instrument, differ significantly between contingent and permanent employees?	***t*-test**
3. Does safety climate, as measured by the Hall Safety Climate Instrument, differ significantly between contingent and permanent employees who self-reported a safety hazard if aware of a hazard?	***t*-test**
4. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by one's level of education?	**ANOVA**
5. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by one's gender?	***t*-test**
6. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by one's age?	***t*-test**
7. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by length of employment?	**ANOVA**
8. Does safety climate, as measured by the Hall Safety Climate Instrument, differ by job position: "Assembly," "Dispatcher," "Maintenance," "Material Handler,"	**ANOVA**

“Packaging,” “Molding,” “Office,” “Order Processor,” or “Warehouse Driver”?	

Summary of Chapter III

In summary, this chapter discussed the instrument use, the study population, data collection methods, and data analysis techniques. Chapter IV will discuss the analysis and interpretation of the data.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

Chapter IV presents the statistical analysis and results of the Hall Safety Climate Instrument, following the collection of data from three office product facilities in Tennessee. The survey response rate is discussed and descriptive data are given for variables, including employee status, age, years of employment, gender, education, department, reporting a work-related injury, and willingness to report a safety hazard.

The purpose of this study was to investigate if there were group differences of contingent workers' safety climate, as compared to permanent workers' safety climate, in the manufacturing of office products in Tennessee. Office product employees completed surveys capturing their safety climate.

Description of the Subjects

For the purpose of this study, the researcher collected data from three office products locations in the state of Tennessee. The researcher collected surveys from each location during scheduled meetings. At the time of the study there were 973 employees at the three locations. 813 (N = 813) employees participated in the study for an 87% response rate. The data were collected in the months of February and March 2011.

Employment Status

Participants were asked to identify their current employment status. Employees were divided into two groups: contingent or permanent. According to the self-reported responses, 353 or 43% of employees had the status of contingent, and 460 or 57% employees had the status of permanent. Data showing employment status are displayed in Figure 1.

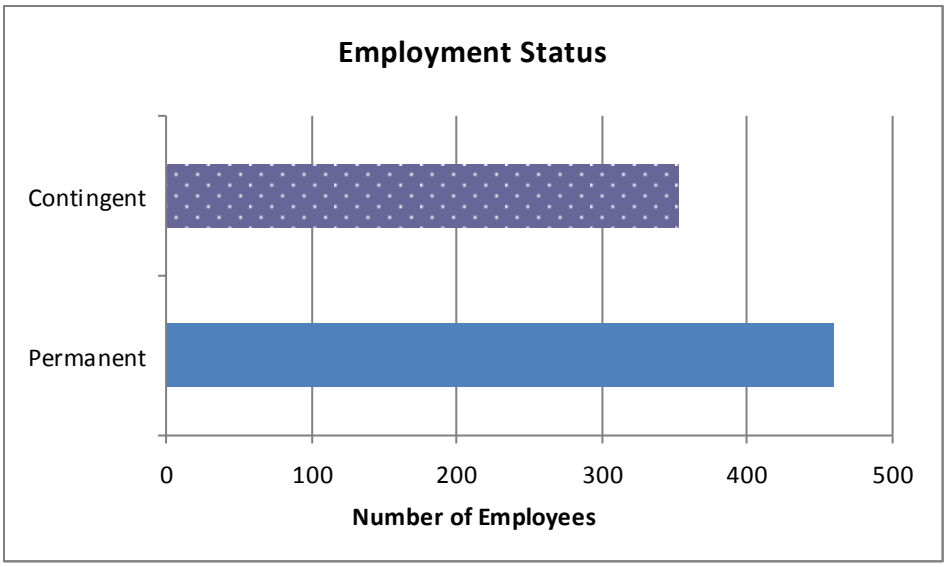

Figure 1: Employment Status

Age of Employees

Participants were asked to identify their current age. According to the self-reported responses, the totals for all employees included 159 or 20% of employees were ages 18-25, 190 or 24% of employees were ages 26-33, 175 or 21% of employees were ages 34-42, 150 or 18% of employees were ages 43-50, 111 or 14% of employees were ages 51-58, and 28 or 3% of employees were age 59 or older. For the purposes of this study, the ages 51-58 and 59 and older were combined. The results are displayed in Figure 2.

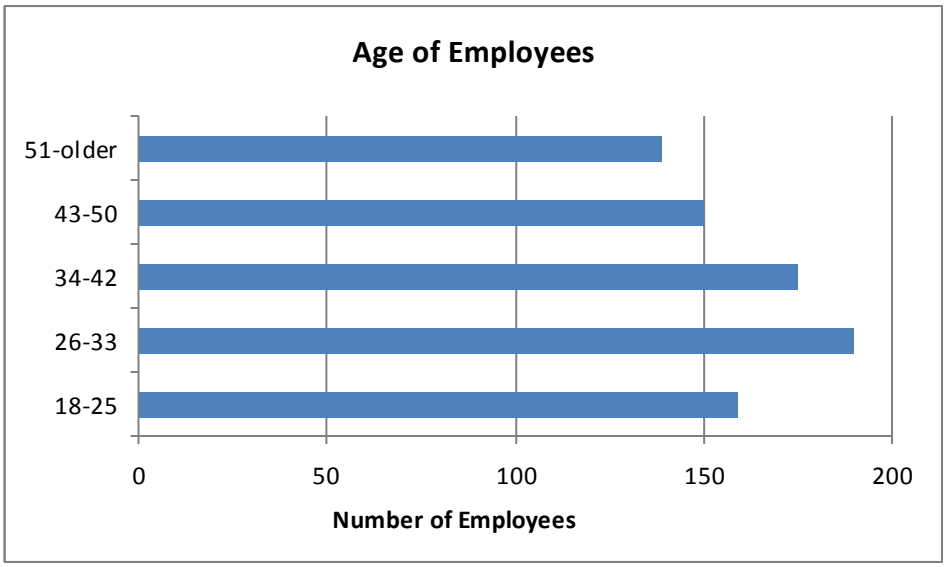

Figure 2: Employee Age, All Employees

Participants were asked to identify their current age. According to the self-reported responses the ages for contingent employees were 117 or 14% of employees were ages 18-25, 100 or 12% of employees were ages 26-33, 53 or 6% of employees were ages 34-42, 42 or 5% of employees were ages 43-50, and 41 or 5% of employees were ages 51-59. The results are displayed in Figure 3.

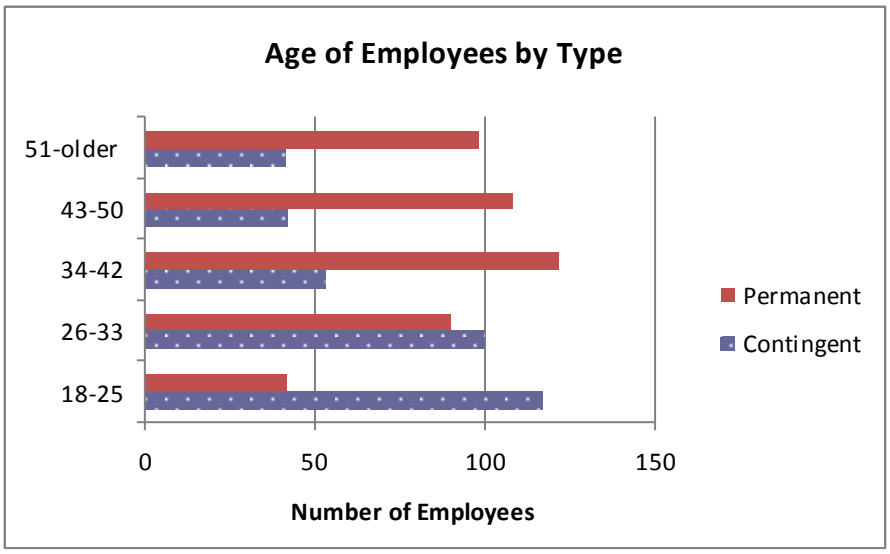

Figure 3: Employees by Type

Years of Employment

Participants were asked to identify their years of employment at each location. According to the self-reported responses of all employees, 271 or 33% had less than 1 year of experience, 148 or 18% had 1-2 years of experience, 38 or 5% had 2-3 years of experience, 42 or 5% had 3-4 years of experience, 57 or 7% 4-5 years of experience, 54 or 7% 5-6 years of experience, 43 or 5% 6-7 years of experience, 160 or 20% had 7 or greater years of experience. For the purposes of this study, 2-3, 3-4, and 4-5 years were combined into one group 3-5. Groups 5-6, 6-7, and 7-greater were combined into one group 5 or more. The results are displayed in Figure 4.

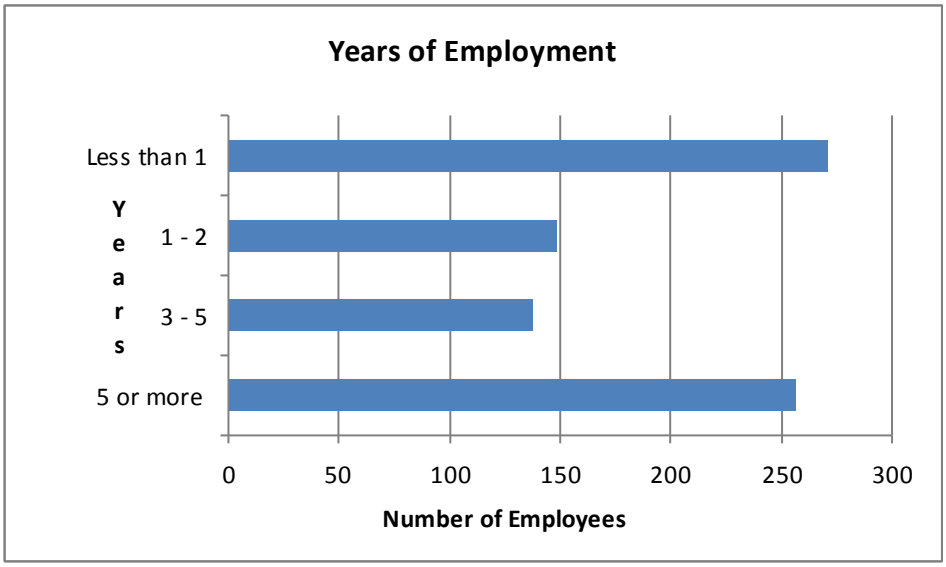

Figure 4: Years of Employment, All Employees

Participants were asked to identify their years of employment at each of the locations. According to the self-reported responses of contingent employees, 205 or 25% had less than 1 year of experience, 79 or 10% 1-2 years of experience, 54 or 7% 3-5 years of experience, and 15 or 2% had 5 years or more of experience. The results are displayed in Figure 5.

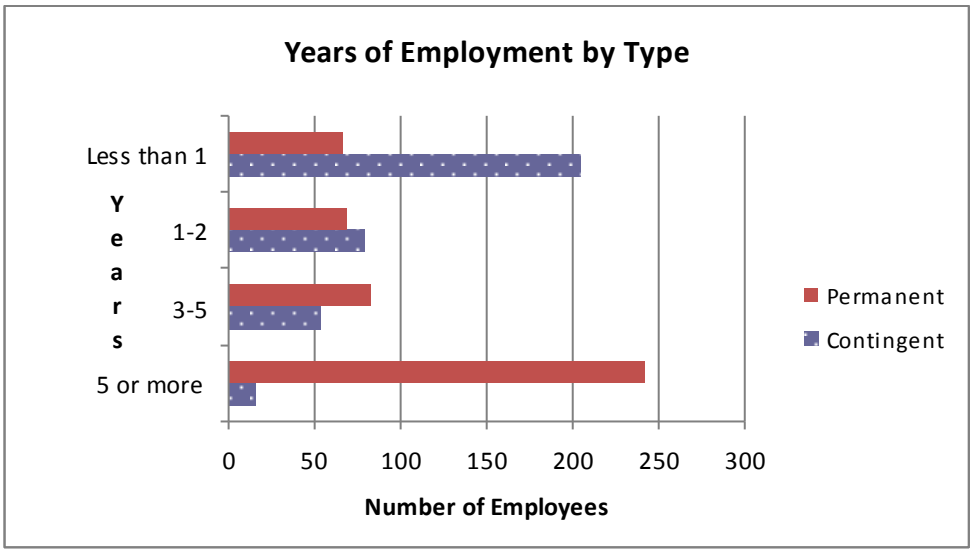

Figure 5: Years of Employment by Type

Gender of Employees

Participants were asked to identify their gender. According to the self-reported responses of all employees, 315 or 39% of employees responded as female, and 498 or 61% responded as male. The results are displayed in Figure 6.

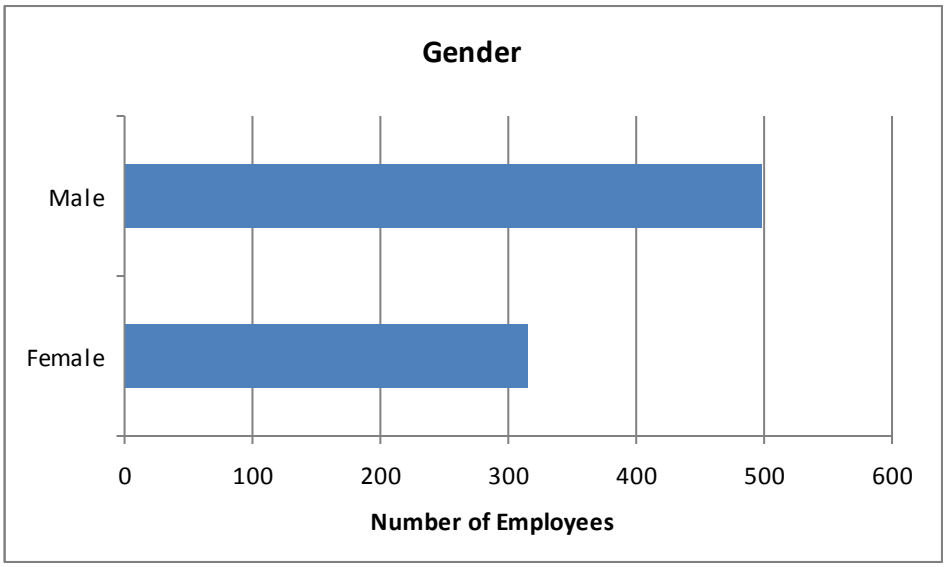

Figure 6: Gender of Employees

Participants were asked to identify their gender. According to the self reported responses of contingent employees, 217 or 27% of employees responded as female and 136 or 16% responded as male. The results are displayed in Figure 7.

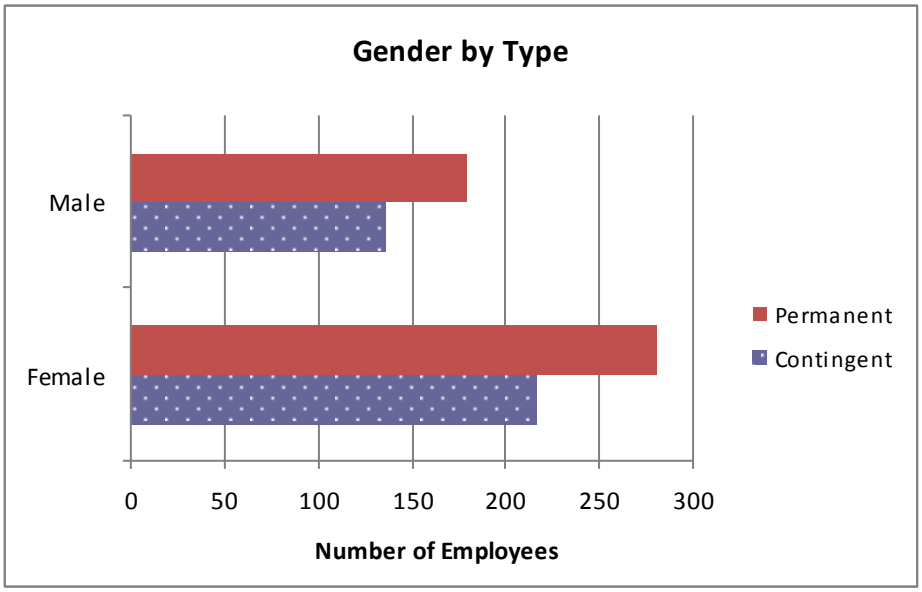

Figure 7: Gender by Employee Type

Education of Employees

Participants were asked to identify their current level of education. According to the self-reported responses of all employees, 571 or 70% of employees indicated having a high school diploma or GED, 76 or 10% of employees indicated not completing high school, 150 or 19% of employees indicated having a college or technical degree, and 16 or 1% of employees indicated having an advanced degree. For the purpose of this study employees with college and advanced degrees were combined. The results are displayed in Figure 8.

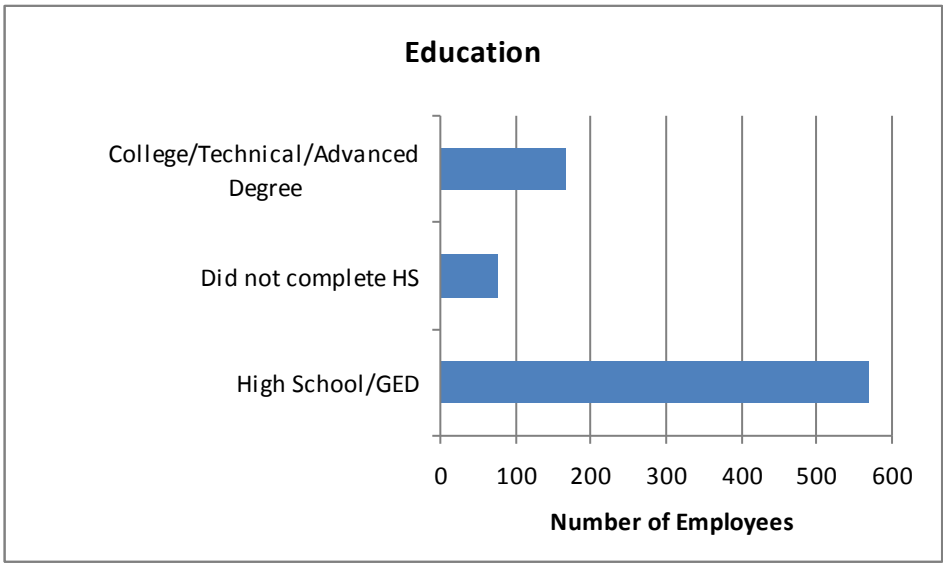

Figure 8: Education of Employees

Participants were asked to identify their current level of education. According to the self-reported responses of contingent employees, 240 or 30% of employees indicated having a high school diploma or GED, 60 or 7% of employees indicated not completing high school, and 52 or 6% of employees indicated having a college or technical degree. The results are displayed in Figure 9.

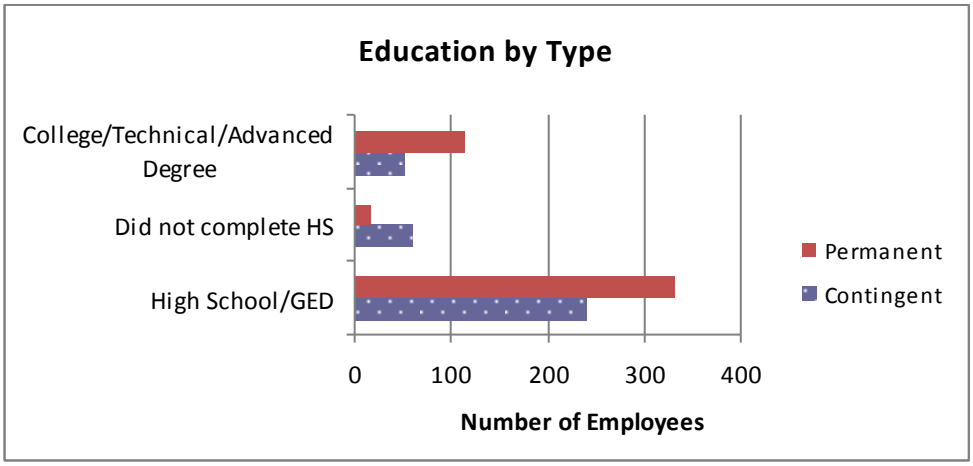

Figure 9: Education by Type

Department of Employment

Participants were asked to identify their current department of employment. According to the self-reported responses for all employees, 38 or 5% of employees worked in maintenance, 39 or 5% of employees worked as material handlers, 42 or 5% of employees worked in molding, 52 or 6% of employees worked in the office, 70 or 9% of employees worked as an order processor, 74 or 9% of employees worked as a warehouse driver, 196 or 24% of employees worked in assembly, and 302 or 37% of employees worked in packaging. The results are displayed in Figure 10.

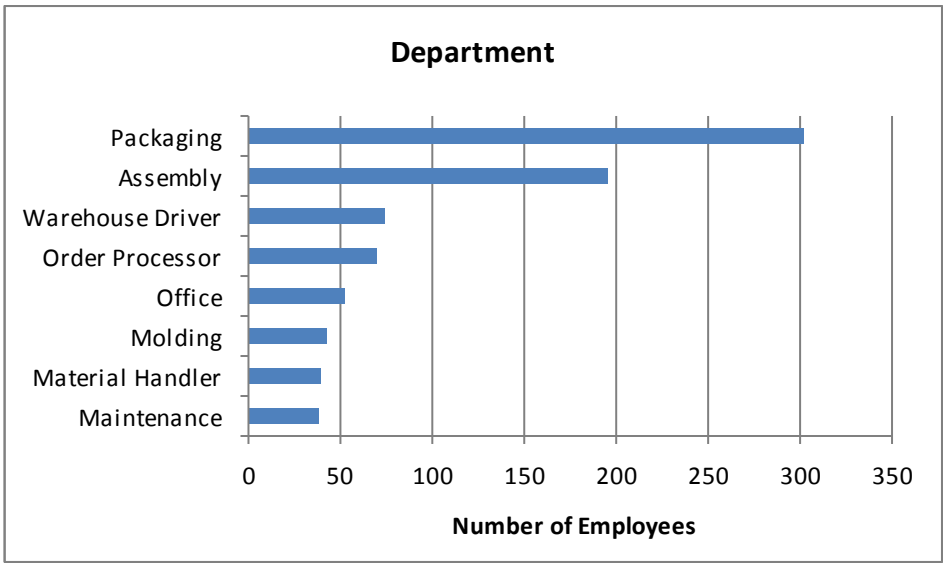

Figure 10: Department, All Employees

Participants were asked to identify their current department of employment. According to the self-reported responses for contingent 5 or less than 1% employees worked in maintenance, 14 or less than 1% employees worked as material handlers, 7 or less than employees worked in molding, 4 or less than 1% employees worked in the office, 36 or 4% employees worked as order processor, 25 or 3% worked as a warehouse driver, 65 or 8% employees worked in assembly, and 197 or 24% employees worked in packaging. The results are displayed in Figure 11.

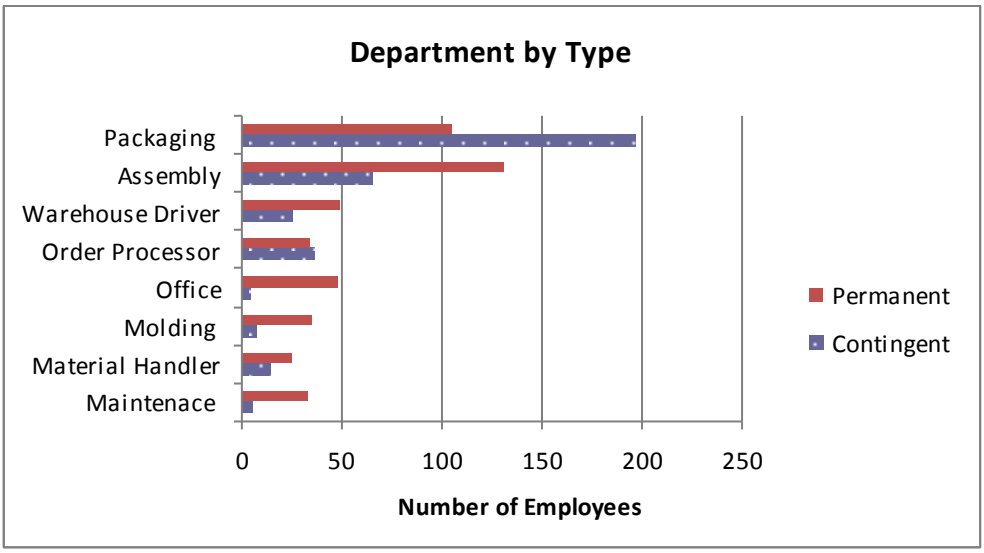

Figure 11: Department by Type

Research Question 1

Does the contingent workers perception of safety climate differ significantly than the perception of permanent employees, as measured by the Hall Safety Climate Instrument?

To determine if there was significance between contingent and permanent employees' safety climate perceptions a *t*-test was used. There was no significance found between the two groups. The results of the *t*-test are t (811) =-.045, p = .964 greater than .05, which was used for significance. The mean for contingent employees was 3.939 and permanent employees were 3.937 out of 5.000. The results are displayed in Table 3. For the purpose of this study a safety climate range was set.

Table 3: Safety Climate

Employee Status	N	Mean	Standard Deviation
Contingent	353	3.9390	.51352
Permanent	460	3.9375	.45600

Research Question 2

How do self-reported safety climate themes measured by the Hall Safety Climate Instrument differ significantly between permanent and contingent employees?

According to the analyzed data, there were no significant differences found between safety climate themes measured by the Hall Safety Climate Instrument. The results were t (811) = 1.314, p = .189. Tables 4 and 5 show the results.

Table 4: Permanent Employee Safety Themes

Theme	Mean	Standard Error	Lower	Upper
Safety	4.212	.021	4.170	4.253
Management	3.830	.028	3.775	3.884
Risk	3.665	.032	3.602	3.727

Table 5: Contingent Employee Safety Themes

Theme	Mean	Standard Error	Lower	Upper
Safety	4.169	.024	4.122	4.217
Management	3.897	.032	3.834	3.959
Risk	3.629	.036	3.558	3.701

Research Question 3

Does safety climate as measured by the Hall Safety Climate Instrument differ significantly between permanent and contingent employees who claimed self-reporting a safety hazard if aware of a hazard?

To determine if there was significance difference between contingent and permanent employees who self-reported a safety injury, a t-test was used. According to the analyzed data, there were significant differences between the two groups' safety climate when self-reporting that the group would report a safety hazard if aware of one. The results of the t-test are t (811) = 3.210, p<.001. Table 6 shows the means of the contingent and the permanent employees.

Table 6: Employees Who Would Report a Safety Hazard

Employee Status	N	Mean	Standard Deviation
Contingent	353	4.15	.722
Permanent	460	4.30	.564

Research Question 4

Does safety climate as measured by the Hall Safety Climate Instrument differ by one's level of education?

According to the analyzed data there was a significance difference between employee's level of education and safety climate. An ANOVA showed there was significance F (5,592) =1.282, p = .004. Table 7 shows the means of the employee's safety climate and education level.

Table 7: Education Level

Education	N	Mean	Standard Deviation
Did not complete HS	76	3.7721	.51106
High School/GED	571	3.9652	.47865
College/Advanced Degree	166	3.9210	.46400

Research Question 5

Does safety climate as measured by the Hall Safety Climate Instrument differ by one's gender?

According to the analyzed data, there was a significance difference between the safety climate of males and females. The results show that t (811) = -1.976, p = .049. The means of males was 3.9116 and females 3.9800. Table 8 shows the results.

Table 8: Gender

Gender	N	Mean	Standard Deviation
Male	498	3.9116	.45950
Female	315	3.9800	.51236

Research Question 6

Does safety climate as measured by the Hall Safety Climate Instrument differ by one's age?

According to the analyzed data, there were no significant differences between age groups for safety climate. An ANOVA was used to determine significance. The results were F (.279) =.065, p = .892. All groups were above three on the safety climate range with a mean of ~3.9. Table 9 shows the means by age group.

Table 9: Age Divisions

Age	N	Mean	Standard Deviation
18-25	159	3.9473	.49905
26-33	190	3.9080	.51965
34-42	175	3.9412	.49994
43-50	150	3.9422	.39549
51+	139	3.9606	.47263

Research Question 7

Does safety climate as measured by the Hall Safety Climate Instrument differ by length of employment?

According to the analyzed data there were significant differences between years of employment. An ANOVA showed there was significance F (7,735) =1.750, p<.001. The means by length of employment are located in Table 10.

Table 10: Years of Employment

Years of Employment	N	Mean	Standard Deviation
Less than 1	271	4.0328	.50906
1-2	148	3.9436	.47748
3-5	137	3.8006	.45630
5 or more	257	3.9086	.44730

Research Question 8

Does safety climate as measured by the Hall Safety Climate Instrument differ by job position: "Assembly," "Dispatcher," "Maintenance," "Material Handler," "Packaging," "Molding," "Office", "Order Processor" or "Warehouse Driver"?

According to the analyzed data there was significance between departments within the facilities. The results were F (4,740) =1.065, p<.001. Table 11 shows the means by department.

Table 11: Department Comparison

Department	N	Mean	Standard Deviation
Assembly	196	4.0474	45305
Material Handler	39	4.0098	.45401
Maintenance	38	3.8537	.31250
Molding	42	3.7836	.46248
Packaging	302	3.9553	.50941
Office	52	3.9847	.46176
Warehouse Driver	74	3.7687	.46059
Order Processor	70	3.8013	.48309

Summary of Chapter IV

Chapter IV presented the analysis and interpretation of data collected from surveys investigating safety climate of contingent and permanent employees. Data were collected from 813 participants or 87% of the population of workers at three plants in the state of Tennessee. The data were analyzed using independent t-tests and ANOVA. The results did not show any

significance in safety climate among contingent and permanent employees. There was significance in the areas of reporting a hazard, education, gender, length of employment, and the department where the employees worked. Chapter V will present the findings, conclusions and recommendations.

CHAPTER V

RESULTS

The purpose of this study was to investigate if there were group differences of contingent workers as compared to permanent workers' safety climate in the manufacturing of office products in Tennessee. Office product employees completed surveys capturing their safety climate. Office product locations throughout Tennessee were selected to serve as the population for the study. Hall's Safety Climate Instrument was used to capture the safety climate of the location and distributed in February and March 2011. This chapter will summarize the findings, provide conclusions, and make recommendations.

Findings

There were 973 employees employed at the three locations at the time the study was conducted. 160 employees did not complete the survey for various reasons, including vacation, FMLA, or not attending a start-up meeting. A total of 813 instruments or 87% were completed and analyzed for the study.

The subjects listed their current employment status as: (1) exempt/salaried, (2) hourly, or (3) temporary. Employees were divided into two groups, contingent or permanent. There were 34 exempt/salaried, 426 hourly, and 353 temporary. Their ages were categorized as: (1) 18-25, (2) 26-33, (3) 34-42, (4) 43-50, (5) 51-58, and (6) 59-older. The results of the self-reported responses: 159 were ages 18-25, 190 were ages 26-33, 175 were ages 34-42, 150 were ages 43-50, 111 were ages 51-58, and 28 were ages 59-older.

For years of employment at each of the locations on the survey the survey listed (1) less than 1, (2) 1-2, (3) 2-3, (4) 3-4, (5) 4-5, (6) 5-6, (7) 6-7, and (8) 7-greater. According to the self-reported responses, 271 had less than 1 year of experience, 148 had 1-2 years of experience, 38

had 2-3 years of experience, 42 had 3-4 years of experience, 57 4-5 years of experience, 54 5-6 years of experience, 43 6-7 years of experience, and 160 had 7 or greater years of experience. There were 315 employees responded as female and 498 responded as male.

For current level of education, 571 or 70% of employees indicated having a high school diploma or GED, 76 or 10% of employees indicated not completing high school, 150 or 19% of employees indicated having a college or technical degree, and 16 or 1% of employees indicated having an advanced degree. For the purpose of this study, employees with college and advanced degrees were combined. The results are displayed in Figures 9 and 10.

The participants were asked to identify the department where they worked. According to the self-reported responses, 38 or 5% of employees worked in maintenance, 39 or 5% of employees worked as material handlers, 42 or 5% of employees worked in molding, 52 or 6% of employees worked in the office, 70 or 9% of employees worked as an order processor, 74 or 9% of employees worked as a warehouse driver, 196 or 24% of employees worked in assembly, and 302 or 37% of employees worked in packaging.

Research Question 1

Does the contingent workers perception of safety climate differ significantly than the perception of permanent employees, as measured by the Hall Safety Climate Instrument?

The data showed that there was no significance between contingent employees and permanent employees. The means of these two groups were virtually identical. The means of the two groups were positive based on the safety climate range that was set for the study. Contingent employees had a mean safety climate of 3.939, and permanent employees had a mean of 3.9375. There was not significance between the two groups but it is important that both groups had a

positive safety climate. If both groups have a positive climate it may indicate that the locations are providing the proper support within the safety themes measured by the instrument.

Research Question 2

How do self-reported safety climate themes measured by the Hall Safety Climate Instrument differ significantly between permanent and contingent employees?

The themes measured by the Hall Safety Climate Instrument do not differ significantly between contingent and permanent employees. All of the themes in both permanent and contingent employees had positive safety climate based on the safety climate range that was set for the study. This result indicates that the contingent employees have a similar climate as the permanent employees.

Research Question 3

Does safety climate as measured by the Hall Safety Climate Instrument differ significantly between permanent and contingent employees who claimed self-reporting a safety hazard if aware of a hazard?

The results support significance between workers when reporting a safety hazard. According to the analyzed data, there were significant differences between the two groups' when self-reporting that the group would report a safety hazard if aware of one. The results show that permanent employees are more likely to report a hazard if aware of one. This finding is not supported by research that was reviewed. According to Cummings and Kreiss (2008) a Swedish study found that contingent workers more likely than permanent workers to report deficiencies in knowledge of workplace safety issues.

Research Question 4

Does safety climate as measured by the Hall Safety Climate Instrument differ by one's level of education?

According to the analyzed data there were significant differences between employee's level of education and safety climate. According to the analyzed data, all means were above 3.1 on the safety climate range no matter what the education level. There was a significant difference between the group of employees who did not complete high school and the group who completed college. All climates were positive regardless of the education level. These results are supported by Gyekye and Salminen (2009). Their study showed a significance that indicated higher-educated subjects evaluated work safety more than lower-educated counterparts (Gyekye & Salminen, 2009). In the same study, higher-educated and experienced workers considered the company's safety programs as more effective than other workers (Gyekye & Salminen, 2009).

Research Question 5

Does safety climate as measured by the Hall Safety Climate Instrument differ by one's gender?

There was significance between the safety climate of males and females. The means of males was 3.911 and females 3.980. The results show that females had a higher safety climate mean. These results are supported by Singer et al. (2009) who found males' safety climate to be lower than female workers' safety climate. According to Johnson (2007), gender had no effect on the safety climate in a study conducted among 292 employees in heavy manufacturing using the Zohar Safety Climate Questionnaire.

Research Question 6

Does safety climate as measured by the Hall Safety Climate Instrument differ by one's age?

There was no difference between ages for this population. All groups were positive with a safety climate of ~3.9 out of a scale of 5.0. These results are consistent with the literature that was reviewed. According to Johnson (2007), age had no effect on the safety climate in a study conducted among 292 employees in heavy manufacturing using the Zohar Safety Climate Questionnaire.

Research Question 7

Does safety climate as measured by the Hall Safety Climate Instrument differ by length of employment?

There was a significant difference between employees length of employment. These results were supported by the literature that was reviewed. In a study conducted in Spain, differences in injury rates between contingent and permanent workers could be accounted for by adjusting for length of employment with the company (Cummings & Kreiss, 2008). Baek et al. (2008) found an S-type distribution with the length of employment in the level of safety climate. According to Johnson (2007), length of employment had an effect on the safety climate in a study conducted among 292 employees in heavy manufacturing using the Zohar Safety Climate Questionnaire.

Research Question 8

Does safety climate as measured by the Hall Safety Climate Instrument differ by job position: "Assembly," "Dispatcher," "Maintenance," "Material Handler," "Packaging," "Molding," "Office,", "Order Processor," or "Warehouse Driver"?

According to the analyzed data there was significance between departments within the facilities. The safety climates were all positive. The differences among the departments came from assembly/packaging and molding and warehouse driver. The two biggest differences between these groups are employment status and length of employment. Assembly and packaging employees are typically contingent employees with less than one year of employment. Molding and warehouse drivers are typically permanent employees with 3-5 years of employment.

Conclusions

From the results of the research, there are differences between contingent and permanent employees safety climate at the facilities that were surveyed. These results are important for safety professionals to understand because of the increase of contingent employees in the workplace. Safety professionals can use these data to understand that both contingent and permanent employees can have positive safety climates.

Based on the findings of this study, the following conclusions were drawn:

1. The results of the study indicate that both contingent and permanent employees had positive safety climates. This result could mean that the current efforts by management to establish a consistent safety climate resonated with the contingent workers. This positive safety climate could be from the orientation process and the influence from the climate of the permanent employees.
2. The results from the analysis of safety climate by themes indicate a positive safety climate. Again this may indicate that current management policies and safety training have created an environment that complements the safety climate for all workers, and includes the contingent workforce.

3. The results show that permanent employees were more likely to self report a safety hazard. This may indicate that permanent employees are more aware of hazards. The longer that an employee works at a location the better their hazard recognition can be. If an employee is more likely to report a hazard or recognize a hazard the more engaged the employee is in safety.
4. Employees with higher education levels can be more likely to follow policy and also less likely to take risk, which would improve their safety climate.
5. Males are more likely to have a lower safety climate than females. According to the data males were more likely to take a risk than females.
6. No matter the age of employee in this study, he/she their safety climate was positive.
7. Employee with less experience had a higher safety climate. This can be interpreted that contingent employees had a more positive safety climate than permanent employees. This could also be an indication that newer employees could have a more positive safety climate because they have not learned the new climate of the location and they may be following the climate of previous employers.
8. According to the analyzed data there was significance between departments. The departments with the higher safety climate were assembly and packaging. These are also the areas of the facilities were the employees with less experience also work. These data can indicate that contingent employees in these areas had a higher safety climate.
9. The population of this study was large and committed to safety. Previous studies in this area have used much smaller populations. In a study by Cox et al., (1998) the population only included 172 contingent employees. This study found that contingent employees had more negative safety climate. The population has limited research conducted on it and from the

literature review there is support for a need to study this group (Luria & Yagil, 2010; Tomas et al., 1999).

10. The researcher was involved in the data collection, which he felt was a strength in the data collection process. This was done after review perceived weaknesses of other studies. "The geographical locations prevented the researcher from being present during the introduction and administration of the survey instrument" (Hall, 2006). "The study locations were geographically dispersed across the United States and thus, the onsite involvement of the researcher at all locations was impractical with the exception of one location" (Findley, 2004).

Recommendations

Based on the results of the research the following recommendations are offered:

1. The safety orientation from these locations should be implemented in other organizations. This orientation process is a possible reason for the positive safety climate at the locations.
2. Contingent employee safety is as important as permanent employees and contingent employees must be involved in the safety process.
3. More focus is needed for male contingent employees because their safety climate was lower than females in this study.
4. Permanent employees must know when contingent employees are onsite because their safety climate can be passed onto the contingent employee.

Summary of Chapter V

This chapter summarized the findings, provided conclusions, and made recommendations. Chapter VI will focus on the importance of the study, observations about the study, and implications for contingent and permanent workers.

CHAPTER VI

THE STUDY IN RETROSPECT

Purpose

The purpose of this study was to investigate if there are differences in the perceived safety climate experienced by contingent as compared to the perceptions of permanent workers' safety climate in the manufacturing of office products. Knowledge of these differences (if any) could help safety professionals provide better safety training and working conditions for contingent workers.

This study provided the safety climate of three operations. This study provided data and results that will add to the research of safety climate. Both employers and contingent employees can benefit from this study.

Implication for Employers of Contingent Employees

This study can provide insight into the behaviors of contingent employees. Employers will be able to use these data to understand the potential to have positive safety climates among contingent employees. With the increase in contingent employees in the work force and the increase in contingent employee injuries it is important for safety manager and professionals to understand that injuries among this group can be controlled as with the permanent workforce.

Future research into training methods and safety orientation for contingent employee injuries can help prevent workplace injuries. A qualitative study into why contingent employees had a positive safety climate would be beneficial to this area of study. This study indicates that contingent employees had a positive safety climate but does not pinpoint the reason for this. A qualitative study could provide insight into potential reasons for the positive safety climate.

Safety professionals and employers of contingent employees can learn a lot from this study because it is important to understand that contingent employees can have positive safety climates. Some possible explanations why contingent employees in this study had positive safety climates are that the permanent employees passed their climate to the contingent employees while they worked together. Another possible explanation is that the training and orientation processes that the contingent employees were exposed to created a positive safety culture with contingent employees. Employers will also see a benefit in hiring and retaining contingent employees. With high safety climate and potential safer work conditions the turn over of contingent employees could potential reduce.

Implications for Contingent Workers

This study can provide data to employers that can be used to help prevent injuries of contingent employee. Contingent employees will benefit from this study by potential injury reduction. Contingent employees will also benefit from a safer workplace and better working conditions.

Summary of Chapter VI

This chapter provided the importance of the study, observations about the study, and implications for employers of contingent employees and contingent workers.

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APPENDICES

APPENDIX A

Survey Results Maryville/Shelbyville

Department	Surveys	Date Completed
Maintenance		
A	10	3/1
B	7	2/25
C	7	
D	7	2/22
Quality	16	2/21
Assembly		
1St	71	2/28 7:10am
2nd	74	2/24 8:30pm
Packaging	58	3/1 7:00am
Weekend	46	2/26 7:00am and 2/26 7:00pm
Tool Room	7	2/28 3:00pm
Molding		
A	11	3/4
B	10	3/4
C	10	3/2
D	9	3/2
A&P	12	2/22
Office	54	2/21
Material Handlers	30	2/23 7:00am
Total	**439**	

Department	Survey	Date Completed
1st POC	165	3/8
2nd POC	160	3/8
Office POC	9	3/7
Total	**334**	
1st SDC	119	3/9
2nd SDC	70	3/8
Office SDC	11	3/10
Total	**200**	

APPENDIX B

Instrument Introduction

Introduction
Hi, my name is Anthony DePietro and I am conducting a safety climate survey at two office products locations in the state of Tennessee. The researcher will use the data for degree requirements. Newell Rubbermaid will review a summary of survey results help determine ways of improving the safety and health program at Newell Rubbermaid. The University of Tennessee and the researcher working on this project will use the information for meeting degree requirements and to expand the body of knowledge about safety climate among contingent and permanent workers. You are invited to voluntarily participate in the study. If you choose to participate in this study your responses will be anonymous and confidential. Your participation is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be destroyed. Return of the completed survey constitutes your consent to participate.

Instructions for completing the survey:
The survey items are a series of statements. Indicate the extent to which you agree or disagree with each by circling your response.

The last page contains items that permit placing your responses into various groups. Indicate your answer by circling your response.

If you do not understand the question, please leave it blank.

Once you have completed the survey, place the survey form into box as instructed by the researcher. Your responses are confidential and should not be shared with others.

Your involvement in the study:
Your participation in the study will benefit you, your employer and the office products industry by identifying important safety concerns, attitudes and beliefs important to your safety, the safety of co-workers and the safety of others who are employed in the office products industry. All survey responses are anonymous to ensure your privacy. If you have questions about your rights as a participant in the University of Tennessee study, contact The University of Tennessee Office of Research Compliance Services at (865)974-xxxx. Thank you for your participation in this research study.

Appendix C

Hall Safety Climate Instrument

Please fill in your response to each item. Completion of this survey acknowledges your voluntary cooperation and all responses will be anonymous; you may decline to participate without penalty. All data will be stored securely and will be made available only to persons conducting the study. No reference will be made in oral or written report which could link participants to the study. Your consent to participate in the research study is obtained by your completion and return of the survey instruments. If you have any questions concerning this survey you may contact the Primary Investigator, Anthony DePietro (865) 816-0771.

All responses will be strictly anonymous so please take the time to answer all survey items to the best of your ability. Indicate the degree to which you agree or disagree by circling the appropriate answer.

Questions	Rating Scale				
My work safety equipment is always in working order	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supervisors regularly discuss work safety goals with me	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am required to regularly attend work safety meetings	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know workers at my company that look out for each other	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Safety procedures make my job safer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Management takes my personal safety seriously	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The training I have received for my job has prepared me to work safely	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I reported a work safety hazard, someone would correct it	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I check my work safety equipment regularly to see if it is working properly	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I use required safety equipment while doing my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Safety meetings give me information that helps me to work safely	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Sometimes I will skip work safety procedures to get my job done	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My job performance will be slower if I follow work safety procedures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I understand the safety risks associated with my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I know how to report work-related injuries	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supervisors listen to my ideas on how to improve work safety	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know workers at my company that can do their job without following work safety procedures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of departments at my company that do not care if work safety procedures are followed	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Before starting a task I make sure that I know all the work safety procedures that are required for that task	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can get safety equipment that is required for my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I have an idea to improve work safety, it will be considered by the company	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Sometimes I am unsure how to do my job safely	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can work in unsafe conditions and not suffer an injury	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Management would respond quickly to my work safety concerns	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I don't know all the work safety hazards for a job, I will still do the job because that's what I'm being paid to do	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supervisors devote sufficient effort to work safety	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Safety procedures required by my job are not necessary to protect me from injury	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I understand safety procedures required by my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I thought an area was unsafe I would check to see what additional safety measures were needed before I entered	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Sometimes I am expected to do more work than I can safely do	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am clear about my responsibilities for job safety	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know other workers at my company that do not follow work safety procedures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would report a work safety hazard if I was aware of one	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I will do whatever it takes to get the job done, even if it means ignoring work safety rules	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Demographics

1. Age

1. 18-25 2. 26-33 3. 34-42 4. 43-50 5. 51-58 6. 59-older

2. Years of employment

1. Less than 1 2. 1-2 3. 2-3 4. 3-4 5. 4-5 6. 5-6 7. 6-7 8. 7-greater

3. Gender

1. Male 2. Female

4. Education

1. Did not complete High School 2. High School/GED 3. College/Technical degree

4. Advanced degree

5. Which location do you work for

1. Maryville 2. Shelbyville POC 3. Shelbyville SDC

6. What is your employment status

1. Exempt/salaried 2. Hourly 3. Temporary

7. Indicate your department

1. Assembly 2. Material handler 3. Maintenance 4. Molding 5. Packaging 6. Office

7. Warehouse Driver 8. Order Processor 9. Dispatcher 10. Safety

8. Indicate your job title

1. Manager 2. Supervisor 3. Lead 4. Other

9. Have you had a job related injury or illness that resulted in first aid treatment in the last year?

1. Yes 2. No

10. Have you had a job related injury or illness that resulted in medical treatment other than first aid treatment in the last year?

1. Yes 2. No

11. Have you had a job related injury or illness that resulted in on the job restrictions or time away from work in the last year?

1. Yes 2. No

APPENDIX D

Instrument Approval

Tony,

You are welcome to use the instrument. With those members on the committee I have no doubt that you'll be in good hands. If I can be of any assistance just let me know.

MH

On 12/21/10 4:13 PM, DePietro, Tony wrote:

Hi Dr. Hall,

I am currently working on my PhD at the University of Tennessee and completing my proposal for my dissertation. I would like permission to use your Hall Safety Climate Instrument for my study. The current title of my study is "Safety Climate Perceptions of Contingent and Permanent Employees Associated with the Manufacturing of Office Products". The members of my committee are the following:

Please let me know if you have any questions or would like to discuss any further

Tony DePietro
Safety Manager

This message may contain information that is confidential and/or protected by law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, copying or communication of this message is strictly prohibited. If you have received this communication in error, please contact the sender immediately and delete the

APPENDIX E
Company Approval

Newell Rubbermaid
Brands That Matter

January 5, 2011

I have spoken to Anthony DePietro about the research he is conducting and have given him permission to conduct research by surveying Newell-Rubbermaid employees.

APPENDIX F

Institutional Review Board

FORM A

Certification for Exemption from IRB Review for Research Involving Human Subjects

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A. PRINCIPAL INVESTIGATOR(s) and/or CO-PI(s) (For student projects, list both the student and the advisor.)**:**

Anthony DePietro	Gregory Petty
Principal Investigator	Professor and Faculty Advisor

B. DEPARTMENT: Public Health

C. COMPLETE MAILING ADDRESS AND PHONE NUMBER OF PI(s) and CO-PI(s):

Anthony DePietro	Gregory Petty
790 Cedar Bluff Road Apt 2708	369 HPER, University of Tennessee
Knoxville, TN 37923	Knoxville, TN 37996
(865) 816-0771	(865)974-4663

D. TITLE OF PROJECT:

Safety Climate Perceptions of Contingent and Permanent Employees Associated with the Manufacturing of Office Products

E. EXTERNAL FUNDING AGENCY AND ID NUMBER (if applicable)**:** N/A

F. GRANT SUBMISSION DEADLINE (if applicable)**:** N/A

G. STARTING DATE (NO RESEARCH MAY BE INITIATED UNTIL CERTIFICATION IS GRANTED.)**:**

February, 2011 or upon grant of IRB certification.

H. ESTIMATED COMPLETION DATE (Include all aspects of research and final write-up.)**: November , 2011**

I. RESEARCH PROJECT

1. **Objective(s) of Project** (Use additional page, if needed.)**:**

The objective of this study is to investigate if there are self reported group differences of contingent workers as compared to permanent workers safety climate, in the manufacturing of office products in Tennessee.

2. Subjects (Use additional page, if needed.)**:**

Subjects will be selected from the employees of Newell Rubbermaid in the State of Tennessee. The locations of the facilities will be in Maryville and Shelbyville, Tennessee. The study will be a population of Newell Rubbermaid employees with a total of 1700 employees. Individuals will not be identified and the response will be kept in a secure location.

Methods or Procedures (Use additional page, if needed.)**:**

Procedures

The instrument will be administered by the researcher at each plant location during pre-production meetings held for all departments. In order to reach the individual workers, a number of meetings are scheduled each week to accommodate workers from different work shifts and departments. The researcher will utilize standard procedures provided in writing to introduce, administer and collect permanent and contingent worker responses to the instrument. The researcher will announce the anonymous survey and read a section that explains how the contributions of the participants would provide information that will be used to measure safety climate. All workers attending each meeting will be invited to voluntarily participate in the research by completing the survey. The researcher will announce that it should take approximately 15 to 20 minutes to complete the survey. The instructions will stress that no identifying marks or numbers that might identify the individual are written on the surveys. Once the survey packets are distributed by the researcher, the researcher will display a box that will be used to collect the survey packet. The researcher will instruct everyone to place the packet received in the box, even if an individual worker chooses not to complete the survey. The researcher will pick one individual in each group to notify the researcher when all members of the group have placed their packets in the box, at which time the researcher will enter the survey area and secure the box and label with the location.

Sample of information provided before survey is administered

I**ntroduction**: Anthony DePietro is conducting a safety climate survey at two office products locations in the state of Tennessee. The researcher will use the data for degree requirements. Newell Rubbermaid will review a summary of survey results help determine ways of improving the safety and health program at Newell Rubbermaid. The University of Tennessee and the researcher working on this project will use the information for meeting degree requirements and to expand the body of knowledge about safety climate among contingent and permanent workers. You are invited to voluntarily participate in the study. If you choose to participate in this study your responses will be anonymous and confidential. Your participation is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be destroyed. Return of the completed survey constitutes your consent to participate.

Instructions for completing the survey:
The survey items are a series of statements. Indicate the extent to which you agree or disagree with each by circling your response.

The last page contains items that permit placing your responses into various groups. Indicate your answer by circling you response.

If you do not understand the question please leave it blank.

Once you have completed the survey, place the survey form into box as instructed by the researcher. Your responses are confidential and should not be shared with others.

Your involvement in the study:
Your participation in the study will benefit you, your employer and the office products industry by identifying important safety concerns, attitudes and beliefs important to your safety, the safety of co-workers and the safety of others who are employed in the office products industry. All survey responses are anonymous to ensure your privacy. If you have questions about your rights as a participant in the University of Tennessee study, contact The University of Tennessee Office of Research Compliance Services at (865)974-xxxx. Thank you for your participation in this research study.

3. CATEGORY(s) FOR EXEMPT RESEARCH PER 45 CFR 46 (See instructions for categories.)**:**

This project should receive category two exemption status because the research uses a self-reported survey with a design that ensures confidentiality and requires no names, social security numbers, or other forms of identification. The data that are gathered will be recorded in a manner that no participant will be identified and only aggregate data will be reported

Instrument:

Hall Safety Climate Instrument

Please fill in your response to each item. Completion of this survey acknowledges your voluntary cooperation and all responses will be anonymous; you may decline to participate without penalty. All data will be stored securely and will be made available only to persons conducting the study. No reference will be made in oral or written report which could link participants to the study. Your consent to participate in the research study is obtained by your completion and return of the survey instruments. If you have any questions concerning this survey you may contact the Primary Investigator, Anthony DePietro (865) 816-0771.

All responses will be strictly anonymous so please take the time to answer all survey items to the best of your ability. Indicate the degree to which you agree or disagree by circling the appropriate answer.

Questions	Rating Scale				
My work safety equipment is always in working order	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supervisors regularly discuss work safety goals with me	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am required to regularly attend work safety meetings	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know workers at my company that look out for each other	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Safety procedures make my job safer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Management takes my personal safety seriously	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The training I have received for my job has prepared me to work safely	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I reported a work safety hazard, someone would correct it	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I check my work safety equipment regularly to see if it is working properly	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I use required safety equipment while doing my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Safety meetings give me information that helps me to work safely	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Sometimes I will skip work safety procedures to get my job done	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My job performance will be slower if I follow work safety procedures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I understand the safety risks associated with my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know how to report work-related	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

injuries					
Supervisors listen to my ideas on how to improve work safety	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know workers at my company that can do their job without following work safety procedures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of departments at my company that do not care if work safety procedures are followed	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Before starting a task I make sure that I know all the work safety procedures that are required for that task	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can get safety equipment that is required for my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I have an idea to improve work safety, it will be considered by the company	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Sometimes I am unsure how to do my job safely	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can work in unsafe conditions and not suffer an injury	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Management would respond quickly to my work safety concerns	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I don't know all the work safety hazards for a job, I will still do the job because that's what I'm being paid to do	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Supervisors devote sufficient effort to work safety	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Safety procedures required by my job are not necessary to protect me from injury	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I understand safety procedures required by my job	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
If I thought an area was unsafe I would check to see what additional safety measures were needed before I entered	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Sometimes I am expected to do more work than I can safely do	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am clear about my responsibilities for job safety	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know other workers at my company that do not follow work safety procedures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would report a work safety hazard if I was aware of one	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I will do whatever it takes to get the job done, even if it means ignoring work safety rules	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Demographics

1. Age
   1. 18-25 2. 26-33 3. 34-42 4. 43-50 5. 51-58 6. 59-older

2. Years of employment
   1. Less than 1 2. 1-2 3. 2-3 4. 3-4 5. 4-5 6. 5-6 7. 6-7 8. 7-greater

3. Gender
   1 Male 2 Female

4. Education
   1 Did not complete High School 2 High School/GED 3 College/Technical degree 4 Advanced degree

5. Which location do you work for:
   1 Maryville 2 Shelbyville POC 3 Shelbyville SDC

6. What is your employment status:
   1 Exempt/salaried 2 Hourly 3 Temporary

7. Indicate your department
   1. Assembly 2. Material handler 3. Maintenance 4. Molding 5. Packaging 4. Office 5. Warehouse Driver

   6. Order Processor 7. Dispatcher 8. Safety

8. Indicate your job title
   1 Manager 2 Supervisor 3 Lead 4 Hourly 5 Temporary

9. Have you had a job related injury or illness that resulted in first aid treatment in the last year?
   1 Yes 2 No

10. Have you had a job related injury or illness that resulted in medical treatment other than first aid treatment in the last year?
   1 Yes 2 No

11. Have you had a job related injury or illness that resulted in on the job restrictions or time away from work in the last year?
   1 Yes 2 No

J. **CERTIFICATION:** The research described herein is in compliance with 45 CFR 46.101(b) and presents subjects with no more than minimal risk as defined by applicable regulations.

Principal Investigator: Anthony DePietro _____
Name Signature
_____ _____
Date

Student Advisor Gregory Petty _____
Name Signature
_____ _____
Date

Department Review Committee Chair: Clea McNeeley _____
Name Signature
_____ _____
Date

APPROVED:
Department Head: Paul Erwin _____
Name Signature
_____ _____
Date

COPY OF THIS COMPLETED FORM MUST BE SENT TO COMPLIANCE OFFICE IMMEDIATELY UPON COMPLETION.

Rev. 01/2005

INSTRUCTIONS FOR COMPLETING FORM A
PLEASE TYPE THE INFORMATION REQUESTED ON THE FRONT OF THIS FORM

Provide the required information in the space available if at all possible. If additional space is necessary, attach a separate sheet. Submit one copy of this form to the Chair of your Departmental Review Committee for review and approval. [PLEASE NOTE: This form may be reproduced on a personal computer and printed on a high quality printer (*e.g.*, LaserJet, DeskJet). Form A was originally created under WordPerfect 6.1 and printed on a HP LaserJet III printer using a 9-point CG Times font.]

ALL SIGNATURES MUST BE ORIGINAL on this form. When certified by your department or unit head, a copy of the signed Form A will be returned to the Principal Investigator and a copy will be returned to the Research Compliance Services Section, Office of Research.

I.1. OBJECTIVES: Briefly state, in non-technical language, the purpose of the research, with special reference to human subjects involved.

I.2. SUBJECTS: Briefly describe the subjects by number to be used, criteria of selection or exclusion, the population from which they will be selected, duration of involvement, and any special characteristics necessary to the research.

I.3. METHODS OR PROCEDURES: Briefly enumerate, in non-technical language, the research methods, which directly involve use of human subjects. List any potential risks, or lack of such, to subjects and any protection measures. Explain how anonymity of names and confidentiality of materials with names and/or data will be obtained and maintained. List the names of individuals who will have access to names and/or data.

I.4. CATEGORY(s) FOR EXEMPT RESEARCH PER 45 CFR 46: Referring to the extracts below from Federal regulations, cite the paragraph(s) which you deem entitle this research project to certification as exempt from review by the Institutional Review Board. **45 CFR 46.101(b): Research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from IRB review:**

(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as: (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, **unless**: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; **and** (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

PLEASE NOTE: *An exemption cannot be used when children are involved for research involving survey or interview procedures or observations of public behavior, except for research involving observation of public behavior when the investigator(s) do not participate in the activities being observed. [45 CFR 46.401(b)]*

(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (2) above, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

(4) Research involving the collection or study of existing data, documents, records, pathological specimens or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

(5) Research and demonstration projects which are conducted by or subject to the approval of Federal Department or Agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

(6) Taste and food quality evaluation and consumer acceptance studies, if wholesome foods without additives are consumed or if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminants at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the US Department of Agriculture.

For additional information on Form A, contact the Office of Research Compliance Officer by e-mail or by phone at (865) 974-3466.

Rev. 01/2005

VITA

Anthony DePietro was born in Eagle, Wisconsin and completed his Bachelor of Science degree in Occupational Safety from the University of Wisconsin Whitewater in 2004. After commencement Anthony began working with Newell Rubbermaid as a safety coordinator.

In 2006 Anthony moved to the state of Tennessee to begin working as the safety manager for Newell Rubbermaid. That same year Anthony enrolled at the University of Tennessee in the Master of Science program. In 2007 Anthony graduated with a degree in safety management. In 2008 Anthony was accepted into the PhD program at the University of Tennessee.

While at Newell Rubbermaid Anthony has reduced the injury rates at multiple locations by more than 85% and has reduced worker compensation costs by 90%. These achievements have been accomplished using techniques learned through education and improvements in safety climate. Anthony has conducted 1000's of hours of safety training throughout his career.

Anthony became a Certified Safety Professional (CSP) in 2008 and has been a member of the American Society of Safety Engineers since 2004 and a member of the National Safety Council since 2009. In 2009 Anthony became an OSHA General Industry Outreach Trainer. In 2010 Anthony was selected as a Student Ambassador for the National Safety Council and in 2011 Anthony presented his research poster on contingent worker safety climate at the National Safety Council. In 2012 Anthony began working with the Kellogg Company in Cary, NC. In Anthony's new position he is responsible for Environmental, Health, Safety, and Security for an 800 employee facility.