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An analysis of the relationship between leadership style and lean expressed through respect, proactivity, and innovative work behavior

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**An analysis of the relationship between leadership style and lean
expressed through respect, proactivity, and innovative work
behavior**

by

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of Berlin, Germany**

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DISSERTATION

Submitted in Partial Fulfillment of the

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Doctor of Philosophy

Organization, Information & Learning Science

The University of New Mexico

Albuquerque, New Mexico

MAY, 2018

DEDICATION

I dedicate this work to my family, who was patient in all these years and to my parents who created my desire to improve myself. But especially I dedicate this work to my three children, Elena, Max, and Ryan. I want you to know how much I love all three of you and how much I do believe in continuous life-long learning and self-improvement.

ACKNOWLEDGMENTS

I want to thank Dr. Law who was my trusted advisor to finish this work. He pushed me to my limits and sometimes certainly beyond them. I want to thank Dr. Gunawardena for her continuous support from my start of the Ph.D. studies to this final step. I want to thank Dr. Van Buren for giving me critical feedback during the development of this thesis and cheering me up when necessary. I want to thank Dr. Mias for his support and advise during the research phase of this thesis.

**An analysis about the relationship of Leadership Style and Lean expressed
through respect, proactivity, and innovative work behavior**

BY

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ABSTRACT

This dissertation is based on the idea that a leadership style is necessary to implement a lean culture within an organization. This research study employed a systematic literature review, from which a lean leadership model was developed. Based on the two principles of a lean organizational culture, 1. respect for people and 2. continuous improvement, three measurable variables were identified, respect, proactivity, and innovative work behavior. These three variables were connected to the lean leadership model. Leadership styles based on the full range model of leadership were used as independent variable(s). The overarching results of this study were: (1) transformational leadership drove respect, (2) management by exception (active) drove proactivity, and (3) transformational and transactional leadership drove innovative work behavior. But transformational leadership drove both, proactivity and innovative work behavior which was mediated by respect. Laissez fair leadership acts in the same way, but negatively. Also, a partial double mediation was confirmed that transformational leadership drove innovative work behavior which was mediated by respect and proactivity yet respect also drove innovative work behavior.

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CHAPTER 1: Introduction

Lean management has been a proven management tool for very successful companies (Ransom, 2007; Kull, Yan, Liu, & Wacker, 2014; Blader, Gartenberg, Henderson, & Prat, 2015), e.g., Toyota, Total, or Lundbeck (Houborg, 2010). The central principles of lean management are a) respect for people and b) continuous improvement (Poksinska, Swartling, & Drotz, 2013; Houborg, 2010; Liker, & Hoseus, 2010). A supportive organizational culture needs to be created to establish these principles in an organization (Hatch & Cunliffe, 2006). The creation of such a “lean” culture depends on the leadership (Mann, 2009). All management levels need to be engaged during a lean implementation (Ohno, 1982; Emiliani, Stec, Grasso, & Stodder, 2003). Leadership is important to achieve successful companies, as has been empirically proven (Ohno, 1982; Emiliani et al., 2003). Success is assumed when companies are sustainable and has content constituents.

A typical implementation problem of lean management is the senior management’s lack of skill to implement lean (Poksinska et al., 2013; Bashin, 2012a). Bashin (2012a) surveyed 68 manufacturing companies trying to implement lean. He reported, depending on size, that 55% to 66% of the companies have experienced this barrier. Other barriers reported were insufficient supervisory skills to implement lean (63% to 73%) and employees’ attitude/resistance to change (60% to 61%). These results supported an earlier survey reporting people-related implementation problems (Deloitte & Touche, 2002).

In contrast, most companies implementing a lean approach reported having the support of the top management (e.g., Davis, 2009; Bhuiyan, Baghel, & Wilson, 2006; Roth, 2006).

Top management's support to introduce lean seems to exist, but leaders appear to lack the ability to introduce/sustain lean (Deloitte & Touche, 2002). Additionally, a cultural-change challenge seems to exist (e.g. Deloitte & Touche, 2002).

A possible approach to overcome these difficulties might be in using a leadership style, which supports the two principles of lean. These two principles are respect for people and continuous improvement (Minter, 2015; Kahlen & Patel, 2011; Li, 2008; Zarbo, 2012; Höök & Stehn, 2008a; Höök & Stehn, 2008b; Grunden, 2009; Liker & Hoseus, 2010).

Hines, Holweg, and Rich (2004) commented that lean is specifically criticized for its lack of human integration. Leadership which supports respect for people before initiating continuous improvement might have better implementation results (MacDuffie, 1995; Sloan, 2011; Dalal, 2010; Hines, 2010; Black, 2009).

Leadership supporting only lean tools achieves low results (Roth, 2006; Aeppel, 2011; Carter et al., 2011) while implementing lean. Lean tools are typical problem-solving tools like A3-method, Kanban, Poka-Yoke, and Andon. The lean tools are directed towards the second principle, continuous improvement. The soft components of continuous improvement, innovative behavior and proactivity of the employees, seem to be often ignored (e.g. Deloitte & Touche, 2002).

This quandary led to this dissertation on leadership style and its connection to respect and continuous improvement expressed through proactivity and innovative work behavior.

Background

First, a very brief overview is given about the lean management history and lean leadership. Then the problem statement and purpose of this study follow.

The origin of lean dates to the scientific management approach. Taylor (1911) stated it is a fallacy to believe that a more efficient production results in more employees out of work, and he suggested that a management system might provoke employees to work inefficiently to protect their interests. These statements express the fundamental assumptions of lean management. The goal of lean management is to increase market share (Atkinson, 2013). Head-count reduction is not the goal of continuous improvement (Atkinson, 2010). A focus on lean tools (e.g. Deloitte & Touche, 2002) suppresses the human factor in an organization. The fundamental issue of scientific management, the neglect of the employees (Littler, 1979), is also the issue of introducing lean.

Taichi Ohno and Eiji Toyoda created the Toyota Production System, which is recognized as a lean system of production (Womack, Jones, & Ross, 1990) based on Taylorism. The book “The machine that changed the world” by Womack, Ross, and Jones (1990) made the Toyota Production System famous. Imai (1986) popularized KAIZEN (Japanese for “change for the best”) worldwide, “*The starting point for improvement is to recognize the need. This comes from recognition of a problem. If no problem is recognized, there is no recognition of the need for improvement. Complacency is the archenemy of KAIZEN.*” (p. 9). Globalization drives the importance of improvement programs and the need for maintaining a competitive advantage (Sim & Rogers, 2009). Both Imai and Ohno described well what wasteful activities are and how

a systematic approach might exist to reduce waste. The waste reduction is the hard-continuous improvement aspect of lean.

But recently authors like Liker and Convis (2011), Emiliani and Emiliani (2013) and Dombrowski and Mielke (2013) discussed lean leadership, and the respect for people, an aspect of lean, and the human aspects of continuous improvement. The principle of respect for people and the human aspects of the continuous improvement principle seem to be important to implement and sustain lean because the main identified barriers to lean implementation are connected to both principles (Bashin, 2012a).

Problem Statement and Statement of Purpose

The leadership theory published by Bass and Bass (2008) described a continuum with three major leadership styles – transformational leadership, transactional leadership, and avoidant leadership. A leader is positioned on this continuum and they suggested that the more transformational a leader is the better. Leadership style might be connected to lean, specifically the aspects of respect, innovative work behavior, and proactivity of employees. The lean leadership literature (i.e., Dombrowski, & Mielke, 2013; Dombrowski, & Mielke, 2014; Liker, & Convis, 2011) does not explain how to measure a lean leadership style or how much it supports creating sustainable companies with content constituents. One challenge is, to improve the nebulous knowledge about the relationship of leadership styles developed within the leadership theory and the principles of lean, mainly developed by practitioners. The fundamental challenge of this study is to analyze the human aspects of lean.

The significance of the study is supported by following possible implications:

For the practitioner a novel way of implementing or sustaining lean might be detected. For the theory of leadership, a novel approach to describe lean leadership might be developed. Also, within the leadership theory, it might be detected that different styles than currently proposed should be combined.

The current analytical research study will shed light on the relationship between leadership style and lean, specifically the two principals, a) respect for people expressed through respect, and b) continuous improvement expressed through innovative work behavior and proactivity.

CHAPTER 2: Review of Literature

The scholarship on lean leadership is rather fragmented. A lot of articles have been published on lean leadership, but an overview of the existing literature does not exist. Therefore, this review of literature aimed to develop a lean leadership model by conducting a systematic literature review. The conducted research based on this leadership model by connecting four variables to the model. Therefore, this literature review provides further a brief overview of a lean culture as organizational culture and an in-depth review of the literature on the used research variables, respect, proactivity, innovative work behavior, and leadership style. Finally, the research questions are presented.

Systematic Literature Review Model

Methods how to conduct systematic literature reviews are presented here. Based on the existing review models, a method was chosen.

Crossan and Apaydin (2010) used a three-step process to conduct a systematic review of literature in the field of management. They first did data collection using a pre-defined algorithm. Next, they analyzed the data using a descriptive statistical method sacrificing depth for breadth by using pattern-matching and explanation building. Lastly, they synthesized the data– producing new knowledge as a product of step 1 and 2.

This review of literature followed the approach of Crossan and Apaydin (2010) because it aligned well both in the context of the body of the sample data to be analyzed and because the literature lacked the statistical documentation found in software and medical literature.

Step 1: Literature Review Data Collection.

The research study used the three-step algorithm process as outlined in Crossan and Apaydin (2010) to conduct a systematic review by first predefining a selection algorithm to reduce the subjectivity of the data collection. A Library Assistant Professor at the University of New Mexico helped to develop search algorithms by using defined strings. Following search terms were defined: “lean leadership”, “lean management” AND “leadership”, and “lean management” AND “culture”. The first two search strings are terms used in defining lean leadership. Based on a definition of leadership by Schein (2010) where he states that leadership defines the culture of a company, the third search string “Culture” was introduced. The search terms produced enough hits on google scholar that a systematic literature seemed justifiable. Lean leadership produced about 1,470 results, “lean management” AND “leadership” about 10,800 results, and “lean management” AND “culture” about 10,900 results (see Figure 1).

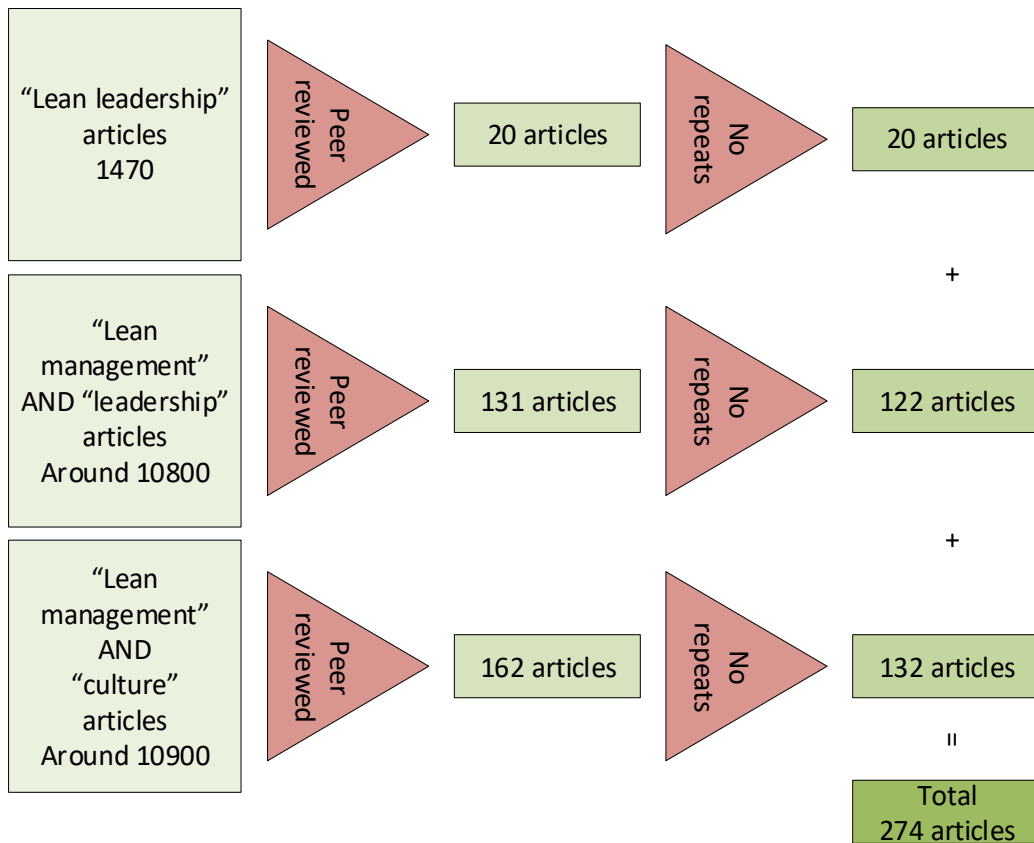


Figure 1: Systematic Literature Review - Search

The search was reduced to peer-reviewed studies on two databases: Web of Science, and Business Source Complete. This reduction led to 313 articles in total. Then all the same articles were eliminated, leading to a total of 274 articles, see figure 1. From the 274 articles, six articles could not be retrieved from the publisher. The library of the University of New Mexico tried to receive a library subscription, but the publisher only offered personal subscriptions. The articles were excluded as the publisher seemed to be only acting as a business improvement magazine and did not appear to be academically engaged. Five articles were excluded from a title examination, e.g., a medical content was presented about reducing weight (lean management), or

they were marketing materials to sell training about lean management. During the literature review process, 35 articles were excluded because they did not inform the phenomenon of lean leadership but used the concept of lean leadership to explain other ideas. Another exclusion criterion was that the articles needed to be in Spanish, English, or German. One article did not fulfill this criterion (see figure 2).

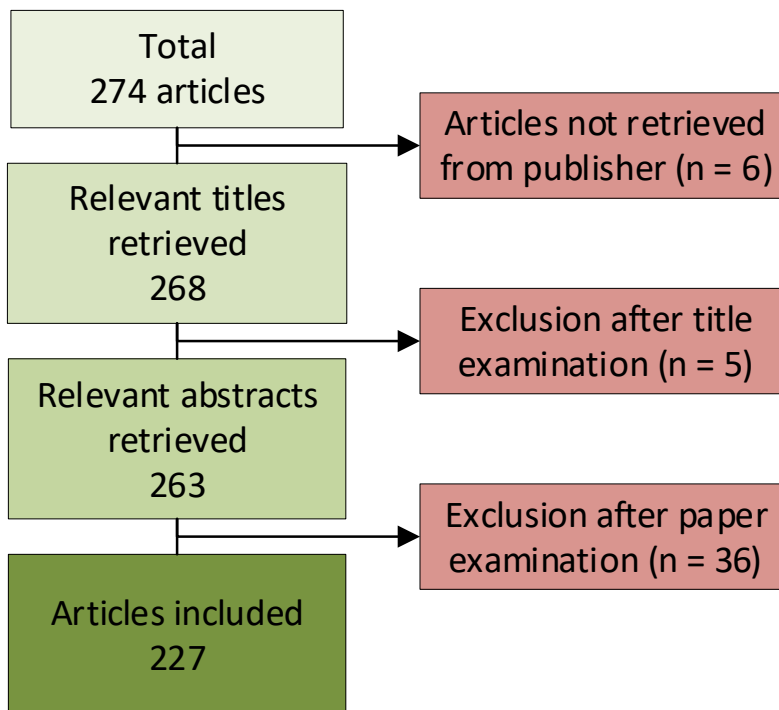


Figure 2: Systematic Literature Review - Exclusion

In Figure 3, the publishing schedule of the remaining articles can be seen.

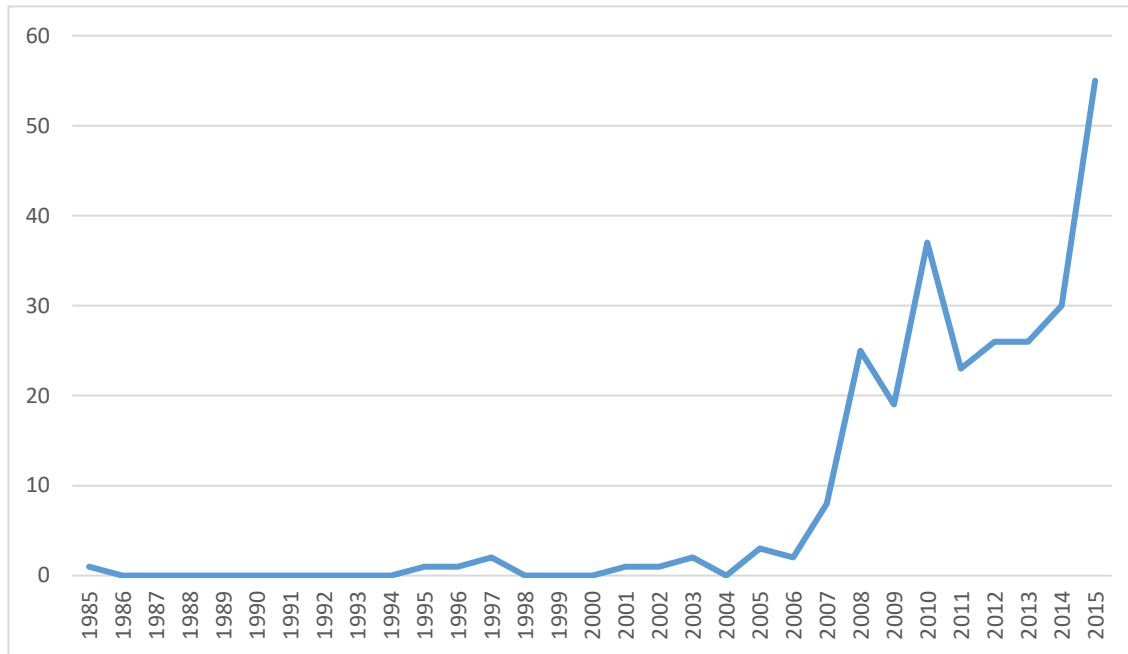


Figure 3: Reviewed Article Timeline

Figure 3 shows that until 2006, there were not very many articles published about lean leadership, but since then, the numbers of articles increased substantially. This pattern is an indicator that the interest in the concept of lean leadership has grown and continues to grow.

In aligning with the Systematic Literature review model, the next step in the review process will show how the data analysis and data synthesis consolidated the literature body and developed the proposed lean leadership model.

Step 2: Literature Review Data Analysis.

The analysis of this review was based on pattern matching and explanation building (Yin, 1994). Following Yin (1994) pattern matching is not a precise science and he suggested the researcher should detect gross matches or mismatches in which an “eyeballing” technique is sufficient to support conclusions. All selected articles were analyzed to find an overall concept of lean leadership and its corresponding constructs. The articles were clustered into several types of articles (see Figure 4).

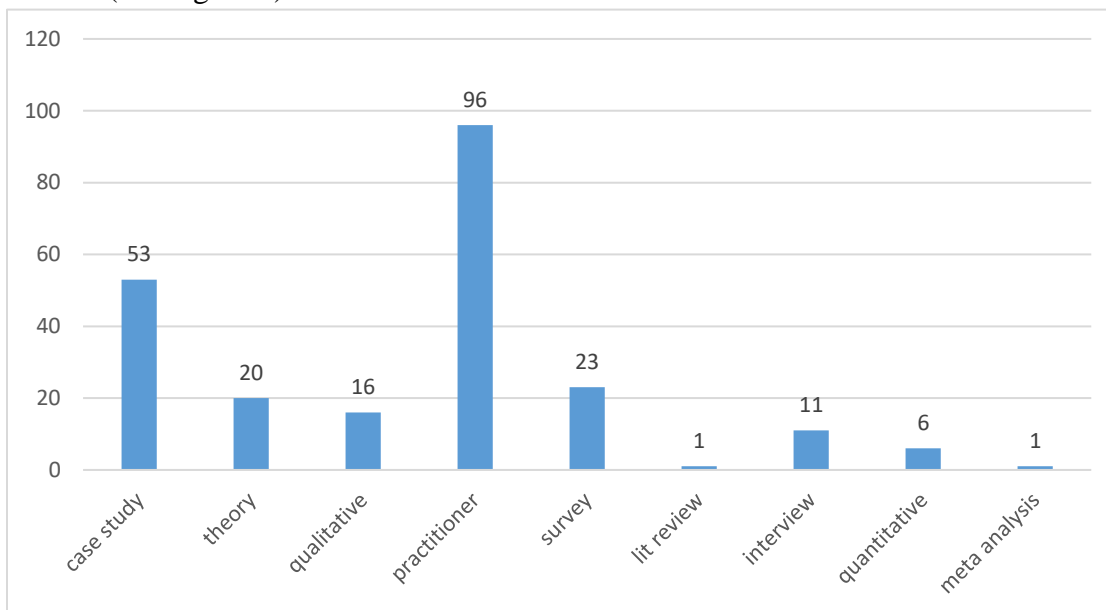


Figure 4: Types of Articles

The clusters of articles were analyzed in the following sequence: quantitative, surveys, qualitative, case studies, meta-analysis, interviews, practitioner reports, lit review, theory. The reason was to identify the lean leadership constructs used in the quantitative, qualitative and survey studies given that these are easier to identify in this kind of articles. Then use this list of potential lean leadership constructs to find support for them in the rest of the cluster of articles except for the theory articles.

The theory articles were taken last to verify and expand the developed conceptual lean leadership model. But they did not provide evidence for the theories presented.

Step 3: Literature Review Data Synthesis.

The new conceptual knowledge produced is the primary value-added product of this review. During the data integration process, it was evident that a quantitative approach was not feasible as in medical studies. Medical systematic literature reviews use mainly correlation data, which can be aggregated. The articles of this systematic literature review did not have enough of this kind of data. Thus, a qualitative approach was taken (Clark, & Creswell, 2010). First nodes were identified by analyzing qualitative, survey, and qualitative articles. Based on the nodes, all literature was analyzed and if a node was supported by at least two articles with more than three authors in total, a finding was assumed. Based on the findings a lean leadership model was created (see Figure 5). This model supported the selection of research variables outlined in Figure 5.

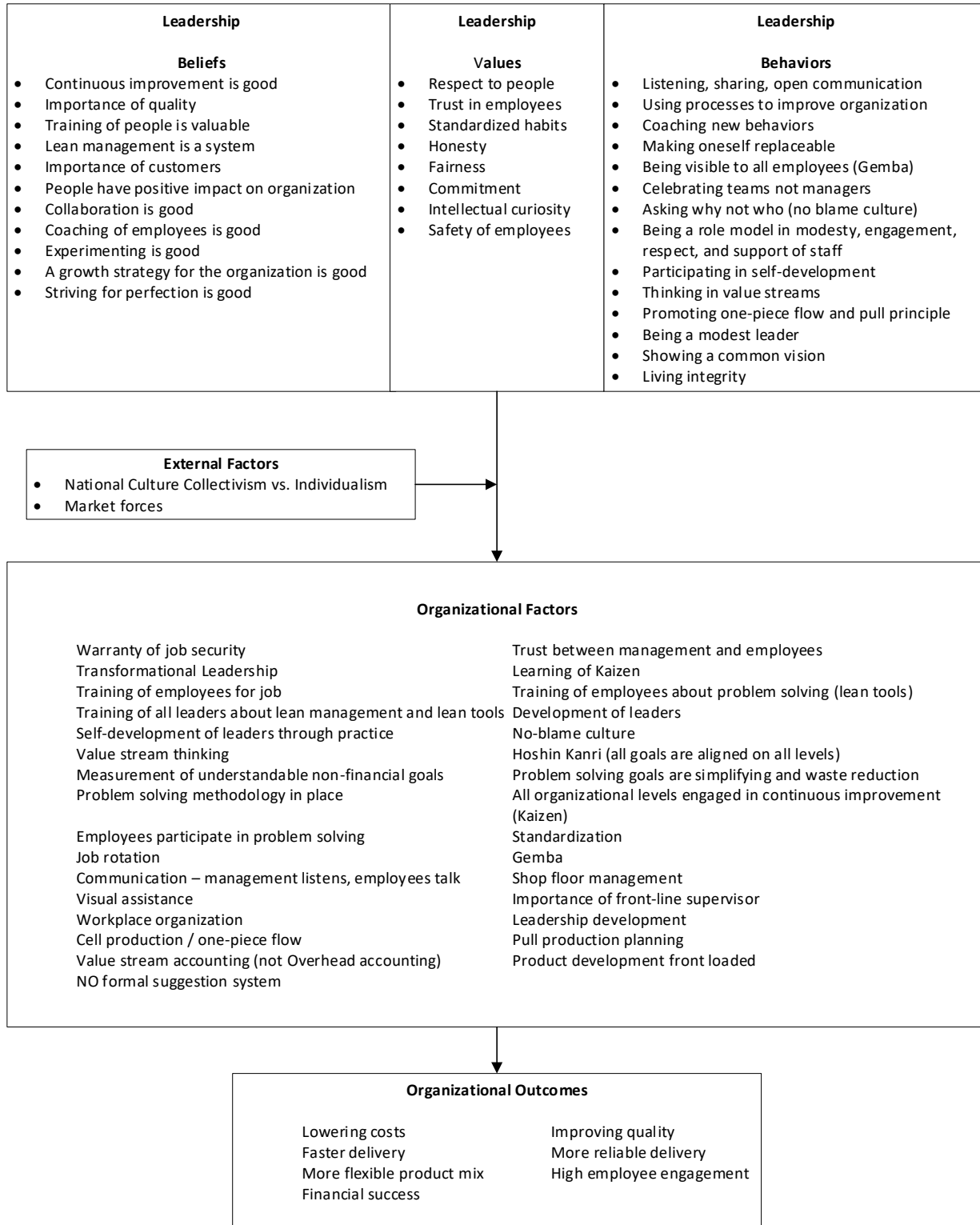


Figure 5: Lean Leadership Model

Culture of Lean

The organizational culture of lean is not well defined. The focus of lean culture seems to be on people and processes (Minter, 2015; Kahlen & Patel, 2011; Li, 2008; Zarbo, 2012; Höök & Stehn, 2008a; Grunden, 2009). Liker and Hoseus (2010) deviated slightly by stating that respect for people (Houborg, 2010; Raines, 2011) and Kaizen were the central pillars of a lean culture (Sturdevant, 2014). The differences between process and Kaizen emphasis might be based on a difference in opinion what the continuous improvement aspect is. Kaizen is Japanese for continuous improvement; most continuous improvement is based on process thinking. This study will follow the thought of Kaizen as it seems to be the more inclusive term.

The key aspect, people in an organization willing to improve productivity, was supported by the research of MacDuffie (1995) and others (e.g., Sloan, 2011; Dalal, 2010; Hines, 2010; Black, 2009). MacDuffie (1995) had not found an answer to the claim of “pressing out” employees (Jones, Latham, & Betta, 2013; Corbett, 2013) in lean nor to the counterclaim of “working smarter.” But he supported Arthur’s (1992) thought of fit between the human resource aspects and production strategy.

The central message is lean is not a tool nor a cost reduction strategy (Liker, & Franz, 2012; Atkinson, 2013; Markovitz, 2016), but a management system rooted in respect for people and search for continuous improvements (Liker & Franz, 2012; Clark, 2016).

Respect seems to be the most important concept in the lean culture. The continuous improvement concept will be analyzed through two lenses, proactivity, and innovative work behavior. The assumption is that employees need to be proactive for being able to conduct innovation.

Respect

Respect might have multiple facets. What is the object of respect? How is respect shown? Authors tried to describe respect, and the two central aspects of respect seem to be attitude and behavior.

Van Quaquebeke and Echloff (2010) defined respect as “a person’s attitude towards other people, in whom he/she sees a reason that, in itself, justifies a degree of attention and a type of behavior that in return engenders in the target a feeling of being appreciated in importance and worth as a person” (p. 344). They emphasized the importance of noticing and understanding others and connected respect with Kant’s (1788) categorical imperative – an employee is an end in itself and not a tool to reach a goal. Downie and Telfer (1969) and Frankena (1986) stated, maintaining a cooperative attitude towards others and acting on it shows respect. Even if the object of respect is disliked, the cooperative attitude to the object of respect still shows respect (Simon, & Stürmer, 2003; Spears, Ellemers, & Doosje; 2005). Additionally, Spears, Ellemers, and Doosje (2005) reasoned that one’s own behavior communicates respect for others.

Respect – Attitude.

Attitudes are artifacts, which are based on values, which are based on beliefs (Schein, 1985a). The following concepts out of in the earlier developed lean leadership model, see figure 5, seem to be connected to the attitude aspect of respect; beliefs, values, and artifacts.

Beliefs.

Within a lean culture, the leaders have to believe in the development of employees (Sarkar, 2011; Black, 2009; Liker, & Franz, 2012), collaboration (Sarkar, 2011; Liker, & Franz, 2012), and coaching of employees (Sarkar, 2011; Petersen, 2010; Liker, & Franz, 2012).

Values.

Hartwell and Roth (2010) reported values of one lean CEO: honesty, fairness, commitment, respect, and encouragement of intellectual curiosity. The safety of employees and others is paramount for lean leaders (Liker, & Hoseus, 2010). Modesty seems to be a unique feature of lean compared to other successful companies (Bortolotti, Boscari, & Danese, 2015). Lean leaders shall accept that they do not have to solve all problems, but their people (Zarbo, 2012). Additionally, a trusting partnership between management and employees is central and should be valued by leaders (Patrick, 2015; Mróz, 2010). This aspect might be foundational to create respect for people.

Artifacts.

Artifacts are everything what an outsider of an organization can easily identify within an organization (Schein, 1985b). This includes symbols, things, rituals etc.. The following artifacts support the lean principle of continuous improvement on a personal level.

The commitment to self-development is mandatory for lean leaders by achieving self-awareness to learn and to improve their knowledge about the Kaizen mind, gemba, teamwork, and respect for people (Dombrowski, & Mielke, 2013; Dombrowski, & Mielke, 2014, Emiliani, 2008; Liker, & Morgan, 2006; Sturdevant, 2014). Carter (2008) additionally suggested that management needs to be humble enough to change earlier outcomes.

Respect – Behavior.

Following Schein (1985a) behaviors are artifacts, which should be observable. The following concepts out of the lean leadership model seem to connect to the behavioral aspects of respect.

Lean leaders value that all employees go home with a sense of fulfillment (Patrick, 2015; Mróz, 2010). Management creates habits to achieve extraordinary results (Patrick, 2015; Liker, & Franz, 2012; Teresko, 2008) like admitting shortcomings, delivering commitments, communicating honestly, sharing ideas, ensuring team member's understanding, and acting as a responsible corporate citizen (Liker, & Hoseus, 2010).

In the daily communication, lean leaders need to share and listen (Patrick, 2015; Li, 2008; Gingerich, 2008; Hach, 2009; Hogan, 2009; Raines, 2011; Muthukumar, Tamizhjothi, & Nachiappan, 2014; Netland, 2016). A common challenge for leaders is to change from top-down work order approach to a bottom-up problem reporting communication approach (Glossmann, Schliebusch, Diehl, & Walshe, 2000; Kahle, 2015).

Lean leaders coach others to develop and apply their talents (Patrick, 2015; Li, 2008; Kavanagh, & Cole, 2013). The true top-down management activity is coaching and teaching (Liker, & Franz, 2012; Hach, 2009; Angelis, Conti, Copper, & Gill, 2011; Badurdeen, & Gregory, 2012; Sturdevant, 2014; Markovitz, 2016) instead of ordering (Clark, 2016; Liker, & Hoseus, 2010; Blader et al., 2015) or problem-solving for others (Liker, & Franz, 2012; Delisle, & Turner, 2010; Badurdeen, & Gregory, 2012). Lean leaders shall make themselves replaceable (Dombrowski, & Mielke, 2014) by coaching others (Flinchbaugh, Carlino, & Curtis-Hendley, 2008; Mann, 2009; Dombrowski, & Mielke, 2013). Bashin (2012a) cautioned that this behavioral change is difficult for managers.

Jusko (2012) suggested the CEO should be on the floor shop conducting gemba. This thought is supported by several authors (Robinson, & Kirsch, 2015; Hogan, 2009; Delisle, & Turner, 2010; Mcloughlin, 2015). Mann (2009) suggested that executive leaders should do two gemba walks per week for 45 to 60 minutes and a lean teacher shall accompany the leader during

the first six to twelve months. But daily practices of lean management seem to be undervalued by senior managers (Emiliani, 2008; Flinchbaugh et al., 2008) yet should be practiced by the lean leader (Liker, & Franz, 2012).

Team achievements shall be recognized and celebrated (Patrick, 2015; Li, 2008; Zarbo 2012; Vago, Bell, & Thompson, 2016; Liker, & Morgan, 2006; Li, 2008) and not the manager.

Lean leaders shall show modesty and support Kaizen, but not intervening directly in problem-solving (Shiba, Graham, & Walden, 1993, Aij, Visse, & Widdershoven, 2015; Dombrowski, & Mielke, 2014; Poksinska et al., 2013; Kenworthy, 2013). Thus, they coach how to problem solve, but not problem solve personally. Lean leaders are role models (Mann, 2009; Dombrowski, & Mielke, 2013; Poksinska et al., 2013, Jusko, 2012; Zarbo, 2012) by showing modesty, engaging in gemba, respecting staff and supporting staff. They do not solve problems but teach how to solve problems (Mann, 2009).

Proactivity

Following Atkinson (2013) an active approach is required to building genuine and robust processes through continuous improvement. For an active approach, leadership needs to allow employees to be proactive.

Proactive behavior is a construct used in psychology and organizational behavior literature (e.g., Bowers, 1973, Schneider, 1983, Bandura, 1986). Lewin (1938) stated that all behavior has both personal and situational causes. Following White (1959) and Langer (1983), the proactive dimension of behavior is based on one's need to change and control the environment. This statement was supported, e.g. by Bandura (1986). Bandura (1986) suggested action and individuals intentionally drive human activity and humans have the opportunity to change their surroundings. The importance of proactive behavior for changing an organization

has been discussed in the literature (e.g., Miles, Snow, Meyer, & Coleman, 1978). And the continuous improvement lean principle requires a constantly changing organization.

Bateman and Crant (1993) defined a proactive personality scale as the ability to intentionally and directly change current circumstances, social or nonsocial. Proactive individuals might exhibit behaviors of 1. problem finding and idea championing (Maynes, McCall, & Kaplan, 1985), 2. innovating (Hirschman, 1970), 3. task revision (Staw, & Boettger, 1990), and 4. affect change (Grant, & Ashford, 2008).

The following will show the four aspects of a proactive personality and their relationship to the lean leadership model.

Problem Finding and Idea Championing.

In the daily communication lean leaders need to share and listen (Patrick, 2015; Li, 2008; Gingerich, 2008; Hach, 2009; Hogan, 2009; Raines, 2011; Muthukumar et al., 2014; Netland, 2016). A typical challenge for leaders is to change from a top-down work order communication to a bottom-up problem reporting interface (Glossmann et al., 2000; Kahle, 2015).

Team achievements are recognized and celebrated (Patrick, 2015; Li, 2008; Zarbo 2012; Vago et al., 2016; Liker, & Morgan, 2006; Lim 2008) and not the manager.

Innovating.

Innovation in lean does not seem to be revolutionary but developmental expressed through continuous improvement (Mehri, 2006). The presented three aspects are not novel for lean companies, but non-lean companies might not use them. The improvement of processes is based on following overarching ideas:

Value stream thinking should be one central aspect of the lean leader's overall management philosophy and drive innovation (Womack, Jones & Ross, 1990; Mann, 2009; Novac, & Mihalcea, 2014; Epstein, 2013; Faulkner, 2013; Sarkar, 2011; Atkinson, 2013; Mcloughlin, 2015; Markovits, 2016). And case studies supported the usage of value-stream mapping (Thomas, 2016; Harris, & Harris, 2015).

One-piece flow production which may require a cell-production layout is another central aspect for lean leaders (Minter, 2010; Davidson, 2008; Zarbo, 2012; Davidson, & MacKay, 2009).

The pull principle seems to be the third central aspect of the lean leader's overall understanding of process functioning (Womack et al., 1990; Mann 2009, Epstein, 2013; Zarbo, 2012).

Task Revision.

Striving for perfection is essential within lean (Womack, Jones & Ross, 1990; Flinchbaugh et al., 2008; Dombrowski, & Mielke, 2013; Zarbo, 2012; Liker, & Morgan, 2006; Henderson, 2008; Gingerich, 2008; Adrian, 2011; Sturdevant, 2014). And this is not negotiable (Black, 2009; Hogan, 2009). It implies to be open to revising all tasks within an organization.

New approaches to work processes have the risk of failure. So, failure is possible (Dombrowski, & Mielke, 2013; Dombrowski, & Mielke, 2014; Dawson, 2008). This risk has to be accepted by managers, and the implementation of new approaches still has to be supported (Mann, 2009; Flinchbaugh et al., 2008; Simon, & Canacari, 2012; Liker, & Franz, 2012). Problems are opportunities to learn and improve (Rahn, 2015; Ludwig, 2014; Wyton, & Payne, 2014; Kenworthy, 2013; Liker, & Franz, 2012); employees are part of the solution and not the problem (Robinson, & Kirsch, 2016; Liker, & Hoseus, 2010; Thomas, 2016; Delisle, & Turner,

2010). So, leaders should ask how to improve (Thomas, 2016). Also, going back to a former solution is viable (Johns, 2015; Carter, 2008).

To Affect Change.

If lean leaders have now accepted that problems exist, improvement is guided by fundamental process thoughts, and tasks get revised, how can the lean leader make the change happen?

Lean leaders use cross-functional interactions to improve processes (Patrick, 2015; Zarbo 2012; Li 2008). And the change process is the responsibility of the work groups and not the management (Liker, & Franz, 2012; Li 2008).

Lean Leaders coach others to develop and apply their talents (Patrick, 2015; Li, 2008; Kavanagh, & Cole, 2013). The true top-down management activity is coaching and teaching (Liker, & Franz, 2012; Hach, 2009; Angelis et al., 2011; Badurdeen, & Gregory, 2012; Sturdevant, 2014; Markovitz, 2016) instead of ordering (Clark, 2016; Liker, & Hoseus, 2010; Blader et al., 2015) or problem-solving for others (Liker, & Franz, 2012; Delisle, & Turner, 2010; Badurdeen, & Gregory, 2012). Bashin (2012b) cautioned that this behavioral change is difficult for managers.

Gemba means that a person needs to physically go to the place where an issue might happen and observe the issue happening (Imai, 1986). Jusko (2012) suggested the CEO should be on the floor shop conducting gemba. This thought is supported by several authors (Robinson, & Kirsch, 2015; Hogan, 2009; Delisle, & Turner, 2010; Mcloughlin, 2015).

Lean leaders are role models (Mann, 2009; Dombrowski, & Mielke, 2013; Poksinska et al., 2013, Jusko, 2012; Zarbo, 2012) by showing modesty, engaging in gemba, respecting staff and supporting staff not in solving problems but learning how to solve problems (Mann, 2009).

The suggested lean leadership model seems to support the four characteristics of a proactive personality.

Innovative Work Behavior

Innovating was already mentioned in the proactivity aspect of the lean culture. But innovative work behavior describes this aspect much deeper.

Innovative Work Behavior is defined through individual employees who “develop, carry, react to, and modify ideas” (Van de Ven, 1986, p. 592) and create ideas (Scott, & Bruce, 1994). In the lean organization, this is expressed through Kaizen, Japanese for continuous improvement. Thus, a lean organization needs to train their employees in Kaizen (Weinstein, 2014; Jusko, 2012; Zarbo, 2012; Hogan, 2009). This kind of behavior should develop employees who can develop, carry, react to, and modify ideas.

Problem-solving promotes continuous improvement (Lawell, 2010). Visuals information like andon, metrics, and other lean tools are used on the shop floor to detect problems (Liker, & Franz, 2012; Thomas, 2016; Liker, & Morgan, 2006; Myszewski, 2015). The goal is to detect problems or abnormalities from the standard (Robinson, & Kirsch, 2015; Clark, 2016; Liker, & Franz, 2012; Badurdeen, & Gregory, 2012). Workers shall participate in problems solving. Thus, not only the process gets improved (Garza-Reyes, Ates, & Kumar, 2015; Robinson, & Kirsch, 2015; Simon, & Canacari, 2012; ; Höök, & Stehn, 2008; Brandt, 2008; Carter, 2008; Hach, 2009; Hogan, 2009; Peterson, 2010; Allen, 2010; Severs, 2010; Raines, 2011; Smith, 2012; Alves,

Dinis-Carvalho, & Sousa, 2012; Kavanagh, & Cole, 2013). But also the people get developed in their problem-solving abilities (Liker, & Franz, 2012; Henderson, 2008).

The development should take place during gemba (Flinchbaugh et al., 2008; Dombrowski, & Mielke, 2014; Emiliani, & Emiliani, 2013; Hogan, 2009; Carr, Lawler, & Reny, 2012). And the learning group should have a low leader to employee ratio (Dombrowski, & Mielke, 2014). The learning event should follow a standardized agenda (Mann, 2009; Poksinska et al., 2013; Vago et al., 2016; Liker, & Morgan, 2006). Individualized learning in short cycles is suggested (Dombrowski, & Mielke, 2014; Poksinska et al., 2013; Delisle, & Turner, 2010). And the learning event should conclude with internal knowledge exchange (Glover, Farris, & Van Anken, 2015).

The use of PDCA (plan do check act - cycle) is suggested to problem solve (Dombrowski, & Mielke, 2013; Hillberg, 2015; Ross, 2014; Wyton, & Payne, 2014; Southworth, 2012; Myrvold, 2011; Zarbo, 2012; Vago et al., 2016; Liker, & Morgan, 2006; Howell, 2015). While using this approach, the root cause analysis is a central element of work during the planning phase (Rahn, 2015; Liker, & Franz, 2012). Managers may avoid this work to cover up incidents or to cut corners (Collins, 2010). FMEA (Fehler Moeglichkeiten Einfluss Analyse) is one methodology to conduct root cause analysis (Rahn, 2015). The C of PDCA is the Gemba walk, and one should wait and observe until the problem occurs (Southworth, 2012; Liker, & Franz, 2012; Tatham, 2008). During the A phase, it is suggested to have a lesson learned session (Glover, Farris, & Van Anken, 2015).

Other methods to problem solve are the A3 method (Faulkner, 2013; Clark, 2016; Delisle, & Turner, 2010) and the tool six sigma (Miguel, & Carvalho, 2014). Six sigma supports

the experimental character of improvement (Spear, 2004; Dawson, 2008; Davidson, & MacKay, 2009).

The management should support the learning of problem-solving through daily activities (Jusko, 2012; Sarkar, 2011; Myrvold, 2011; Hartwell, & Roth, 2010; Hines, 2010; Delisle, & Turner, 2010; Kahle, 2015). These activities might be checking the conditions, reviewing the objectives, and pointing out problems (Mann, 2009; McCreary, 2010; Poksinska et al., 2013; Rahn, 2015; Kenworthy, 2013; Raines, 2011).

A specific area of learning should be safety (Semiklose, 2014; Raines, 2011; Petersen, 2010; Mróz, 2010; Jusko, 2012).

The success of problem-solving can be measured by developed standards (Liker, & Morgan, 2006) and is supported by the six-sigma methodology (Bessette, 2012).

The management should take into consideration, what type of Kaizen takes place, Blitz-Kaizen or developmental Kaizen. It might be preferable to implement fast, small improvements than waiting for a perfect solution (Delisle, & Turner, 2010; Marksberry, 2012). But Hines (2010) and Black (2009) cautioned managers, Blitz-Kaizen lead to short-term effects but are not sustainable. The developmental Kaizen approach seems to be more promising (Liker, & Morgan, 2006; Atkinson, 2013).

A fundamental misunderstanding of Kaizen learning is that it can be achieved through activities only in a classroom (Liker, & Franz, 2012). The management participating in Kaizen should ask questions and let the front-line employees problem-solve on the floor shop (Gingerich, 2008; Netland, 2016). The presence of management is critical during Kaizen (Cameron-Strother, 2010; Liker, & Hoseus, 2010; Delisle, & Turner, 2010).

The continuous improvement activities should be a routine activity for all employees (Clark, 2016; Liker, & Franz, 2012; Tatham, 2008; Allen, 2010; Kavangh, & Cole, 2013) and a central aspect of the organization (Liker, & Morgan, 2006; Peterson, 2010; Jusko, 2011; Smith, 2012; Alves, Dinis-Carvalho, & Sousa, 2012; Andel, 2013; Bortolotti et al., 2015). These findings stay in contrast to Raines (2011), who suggested a formal suggestion system.

Mehri (2006) cautioned that the continuous improvement process stops truly creative new solutions to problems and employees develop a lot of depth but not the breadth of their knowledge. The depth of employee knowledge is confirmed by Liker, Morgan (2006).

The engagement of management can be measured by employees if barriers get removed (Robinson, & Kirsch, 2015; Kavanagh, & Cole, 2013; Netland, 2016) and by the speed of the implementation process (Vago et al., 2016).

The innovation should not only be driven by standard improvement processes but also through non-financial goals and key areas set by leadership (Hillberg, 2015). This aspect is a connection between goal setting, hoshin kanri, and continuous improvement and management needs to support challenging the status quo by setting the right goals (Sarkar, 2011; Netland, 2016).

Full-Range Leadership Model

The culture of lean was described with its two principles, respect, and continuous improvement (Liker, & Hoseus, 2010). But no measurement of lean leadership exists. The leadership theory has developed an approach to measure leadership styles (Avolio, & Bass, 1998).

Avolio and Bass (1998) developed the full-range leadership model, including following leadership styles: transformational leadership, transactional leadership, and passive/avoidant behavior leadership styles. This research study will describe how the Lean Leadership model might be connected to these leadership styles.

A central aspect of Lean Leadership seems to be developing a relationship with employees by being visible through gemba, kaizen, and coaching employees (Flinchbaugh et al., 2008; Poksinska et al., 2013; Emiliani, & Emiliani, 2013; Thomas, 2016; Delisle, & Turner, 2010). This visibility is related to the transformational leadership style.

The importance of transformational leadership is supported by Poksinska, Swartling, and Drotz (2013) and Liker, and Franz (2012). In a survey of six companies and 240 respondents, Li, Nahm, Wyland, Ke, and Yan (2015) concluded, transformational leadership creates employee's trust into leadership - creating an organizational culture of open communication which leads to worker participation in problem-solving.

Hartwell and Roth (2010) supported a people-oriented non-competitive leadership style. In contradiction, Doss and Orr (2007) reported dictatorial/autocratic behaviors in Hungarian supposed to be lean companies, but their study relied on a self-definition of lean, which is not congruent with the lean definition of other authors. The people orientation supports the idea of transformational leadership.

It is important to observe that the lean literature mentions transformational leadership as a desirable leadership type. The literature does not address other leadership styles suggested by Avolio and Bass. It seems to be promising to measure the leadership style within an organization as suggested by Avolio and Bass (1998).

Theoretical Background

LMX defines the quality of the leader's and employee's relationship (e.g. Graen, & Scandura, 1987). One party offers something valuable to other. Studies showed that followers engage in behaviors directly related to their leaders (e.g. Wayne, Shore, & Liden, 1997).

Based on the LMX theory, it might be possible that a leadership style influence directly the variables respect, proactivity, and innovative work behavior. Having this theoretical approach, three multivariate regressions seemed promising.

POS defines the quality of the employee and organization relationship by measuring the employee's believe how much their organization values their contributions and welfare (Eisenberger, Huntington, Hutchison, & Sowa, 1986). Depending on how an organization treats and values an employee, the organization can expect a stronger employee's devotion to achieve organizational goals (Settoon, Bennett, & Liden, 1996; Wayne, Shore, & Liden, 1997).

An employee in a lean organization might be related to the organization through proactivity or innovative work behavior. The quality of these relationships might be influenced by the perceived received respect from a leader. Taking POS into account, it might be the case that respect is a mediator in the LMX relationship between transformational leadership and either proactivity or innovative work behavior. This thought leads to simple mediation models.

But Crant, 2000, cautioned that proactive behavior has emerged as a research stream in the organizational behavior literature without having a single definition or theory. Research was conducted through a lens of proactivity and initiative (e.g. Deluga, 1998). A common denominator might be that employees take an active approach towards organizational goals (Crant, 2000). A visible organizational goal in lean is the second principle of lean, continuous improvement. In the definition of proactivity innovating is one of four constructs used.

Innovative work behavior is entirely focusing on innovating. Additionally, another construct of proactivity is problem finding. Innovative work behavior cannot happen without agreement on having at the first place a problem (Imai, 1986). Therefore, it could be that proactivity is necessary before innovative work behavior can take place. A double mediation analysis is necessary to verify this idea. The leadership style addressing the 1st principle of lean, respect for people, is connected through respect and proactivity to the organizational goal innovative work behavior.

Overview of the Study

The purpose of this study is to verify if a relationship exists between leadership style and lean, specifically the two principals, respect for people and continuous improvement, expressed through innovative work behavior and pro-active employees.

The following questions shall be investigated:

The research questions are

1. Do leaders with transformational leadership style score higher on respect of employees than other leadership styles at manufacturing organizations in North America?
2. Do leaders with transformational leadership style score higher on innovative work behavior of employees than other leadership styles at manufacturing organizations in North America?
3. Do leaders with transformational leadership style score higher on proactivity of employees than other leadership styles at manufacturing organizations in North America?
4. Does a mediation effect exist between transformational leadership and innovative work behavior mediated by respect?

5. Does a mediation effect exist between transformational leadership and proactivity mediated by respect?
6. Do double mediations effects exist between one of the five leadership styles and innovative work behavior mediated by respect and proactivity? (This mean, is the independent variable, a leadership style, mediated by two variables, respect and proactivity, influencing the dependent variable, innovative work behavior?)

An improved understanding of these relationships might increase the ability of companies to introduce and sustain lean management (Bashin, 2012b; Mann 2009).

Based on the questions and the literature review following hypotheses are stated:

1. Leaders with transformational leadership style score higher on respect of employees than other leadership styles at manufacturing organizations in North America.
2. Leaders with transformational leadership style score higher on proactivity of employees than other leadership styles at manufacturing organizations in North America.
3. Leaders with transformational leadership style score higher on innovative work behavior of employees than other leadership styles at manufacturing organizations in North America.
4. A mediation effect exists between transformational leadership and innovative work behavior mediated by respect.
5. A mediation effect exists between transformational leadership and proactivity mediated by respect.
6. Double mediation effects exist between one of the five leadership styles and innovative work behavior mediated by respect and proactivity.

CHAPTER 3: Methodology

Introduction

The current study aims to examine the relationship between leadership styles and respect, innovative work behavior, and proactivity. An improved understanding of these relationships might increase the ability of companies to introduce and sustain lean management (Bashin, 2012b; Mann, 2009). The participants are in a leadership role of manufacturing organizations in North America. This chapter explains the research questions, the research design, the variables, and the hypotheses,

The research questions are

1. Do leaders with transformational leadership style (TL) score higher on respect of employees than other leadership styles (LS) at manufacturing organizations in North America?
2. Do leaders with transformational leadership style score higher on proactivity of employees than other leadership styles at manufacturing organizations in North America?
3. Do leaders with transformational leadership style score higher on innovative work behavior (IWB) of employees than other leadership styles at manufacturing organizations in North America?
4. Does a mediation effect exist between transformational leadership and innovative work behavior mediated by respect?
5. Does a mediation effect exist between transformational leadership and proactivity mediated by respect?
6. Do double mediation effects exist between one of the five leadership styles and innovative work behavior mediated by respect and proactivity?

The research questions, corresponding designs, variables, analytical designs, and data sources are summarized in the following table.

Research Question	Study design	Variable	Data Analysis	Data Source
Do leaders with transformational leadership style score higher on respect of employees than other leadership styles at manufacturing organizations in North America?	Correlational Design	LS and Respect	Multi-variate regression	Survey
Do leaders with transformational leadership style score higher on innovative work behavior of employees than other leadership styles at manufacturing organizations in North America?	Correlational Design	LS and IWB	Multi-variate regression	Survey
Do leaders with transformational leadership style score higher on proactivity of employees than other leadership styles at manufacturing organizations in North America?	Correlational Design	LS and Proactivity	Multi-variate regression	Survey
Does a mediation effect exist between transformational leadership and innovative work behavior mediated by respect?	Correlational Design	TL, Respect, and IWB	Multi-variate regression mediation analysis	Survey
Does a mediation effect exist between transformational leadership and proactivity mediated by respect?	Correlational Design	TL, Respect, and Proactivity	Multi-variate regression mediation analysis	Survey
Do double mediation effects exist between one of the five leadership styles and innovative work behavior mediated by respect and proactivity?	Correlational Design	TL, Respect, Proactivity, and IWB	Multi-variate regression double mediation analysis	Survey

Table 1: Research Design Summary

Leadership Style (LS), Transformational Leadership (TL), Innovative Work Behavior (IWB)

Research Design

The suggested research has six major objectives: to examine the relationship between (1) leadership styles and respect, and (2) leadership styles and innovative work behavior, (3) leadership styles and proactivity, to verify (4) a mediated relationship between transformational leadership to proactivity mediated by respect, (5) a mediated relationship between transformational leadership to innovative work behavior mediated by respect, and 6) double mediated relationships between each leadership style to innovative work behavior mediated by respect and proactivity. A quantitative study, correlational design (Creswell & Clark, 2010), was used to address these objectives. First, I present the participants of the study. Second, I explain the measurements used. Third I explain the data preparation process to synthesize the raw data of the survey to a meaningful analyzable data set. And finally, I explain the data analysis process. The analyses process distinguishes between a multivariate regression, mediation analysis, and double mediation analysis.

Participants.

An eight billion and a four billion company participated in this research study. All businesses run more than 25 plants each with hundreds of leaders in total. All organizations are manufacturer converting raw materials into products and face similar types of problems even though they are active in different markets. Both organizations provided data about five plants with five to six leaders each. All plants are located in North America.

The participating organizations were offered to receive a general report about the current existing leadership styles within their plants, a benchmark to other organizations,

and a follow-up discussion for leadership development if desired. The participants taking the survey were not offered anything.

The participants were employees in leadership positions of the manufacturing organizations mentioned above. All participants had a mid-level leadership position. They were selected to inform this research as the leadership team of a plant should drive the daily continuous improvement efforts. A mid-level leadership position was defined as having directly reporting employees and not being the top-leader supervising several manufacturing sites. All participants are leaders and therefore qualified to have their leadership style measured. Both companies produce goods for industrial clients who are active in consumer markets. And a competitive environment demands innovation and proactivity (R. Skillmann, personal communication, January 12th, 2017). Kodak is an example what happens to even great companies if innovation is ignored. The organizations conducted for the first time this kind of survey.

Measures.

First, I present the leadership style variables, which is explained by five variables. A set of five variables are connected to the transformational leadership style (Avolio, & Bass, 1998), two variables are connected to a transactional leadership style (Avolio, & Bass, 1998), and two variables are connected to the passive/avoidant behavior style (Avolio, & Bass, 1998). All five variables together represent the full range leadership style model (Avolio, & Bass, 1998). Each variable has five items, and the scale per item is 0 to 4. (0 – not at all, 1 – once in a while, 2 – sometimes, 3 – fairly often, 4 – frequently if not always).

Leadership Style (Independent Variables).

During the literature review the leadership style transformational leadership was identified as a potential leadership style within lean companies. But transformational leadership is only one possible style measured by the Multifactor Leadership Questionnaire (MLQ) (Avolio & Bass, 1998). The MLQ measures the following leadership styles: Transformational Leadership Style, Transactional Leadership Style, and Passive/Avoidant Behavior Leadership style (Avolio, & Bass, 1998). All following variables described are measured on a Likert-type scale, with the following values: 0 (not at all), 1 (once in a while), 2 (sometimes), 3 (fairly often), and 4 (frequently, if not always) (Avolio, & Bass, 1998). Following the Multifactor Leadership Questionnaire (MLQ) (Avolio & Bass, 1998), a complete list of items can only be provided in the IRB proposal, but sample items will be given below. The MLQ uses five items to measure each leadership style.

Transformation Leadership.

The Transformational Leadership Style (TL) describes leaders who change employees' awareness of essential items and open their mind to evaluate themselves and the opportunities of their environment (Avolio, & Bass, 1998). Transformational Leaders seek to improve individuals, groups, and organizations (Avolio, & Bass, 1998). This leadership style is expressed through five variables (Avolio, & Bass, 1998).

Idealized Influence Idealized Attributes.

Leaders create pride in others for being connected to them, they put the group before their self-interest, their actions create respect, and they display power and confidence (Avolio, & Bass, 1998).

A sample item is

The person I am rating goes beyond self-interest for the good of the group

Idealized Influence Idealized Behaviors.

Leaders share their most important values and beliefs, they consider morals and ethics and emphasize the collective mission (Avolio, & Bass, 1998).

A sample item is

The person I am rating considers the moral and ethical consequences of decisions

Inspirational Motivation.

Leaders are optimistic about the future; they engage employees to accomplish goals, they communicate a desirable vision and demonstrate confidence that goals will be met (Avolio, & Bass, 1998).

A sample item is

The person I am rating articulates a compelling vision of the future

Intellectual Stimulation.

Leaders verify assumptions to questions; they verify multiple perspectives during problem-solving, they make others to look at problems, too and promote new techniques to accomplish goals (Avolio, & Bass, 1998).

A sample item is

The person I am rating gets me to look at problems from different angles

Individual Consideration.

Leaders are coaches; they see employees as individuals, they accept that individuals have different needs, and aspirations than a group and they help employees to develop their strengths (Avolio, & Bass, 1998).

A sample item is

The person I am rating helps to develop my strengths

Transactional Leadership Style.

The Transactional Leadership Style describes leaders who use constructive and corrective transactions (Avolio, & Bass, 1998). The constructive style is called contingent reward (CR) and the corrective style management-by-exemption (active) (MBEA) (Avolio, & Bass, 1998).

Contingent Reward.

Leaders who assist employees in exchange for their efforts, they give clear performance goals, explain the rewards when goals are achieved, and applaud when expectations are met (Avolio, & Bass, 1998).

A sample item is

The person I am rating discusses in specific terms who is responsible for achieving performance targets

Management-by-Exemption (Active).

Leaders who focus on mistakes, and deviations from standards. They concentrate on dealing with failures and track all mistakes to achieve goals (Avolio, & Bass, 1998).

A sample item is

The person I am rating focuses attention on irregularities, mistakes, exceptions, and deviations from standards

Passive /Avoidant Behavior Leadership Style.

The Passive/Avoidant Behavior Leadership Style describes leaders who are more passive and reactive (Avolio, & Bass, 1998). Two variables describe this style, Management by Exemption (Passive) (MBEP) and Laissez Fair (LF) (Avolio, & Bass, 1998).

Management-by-Exemption (Passive).

Leaders who do not act until a problem is serious. They show a belief in the status-quo (Avolio, & Bass, 1998).

A sample item is

The person I am rating fails to intervene until problems become serious

Laissez-Faire.

Leaders who avoid getting involved. They make themselves invisible when needed and avoid making any decisions or delay responding to questions (Avolio, & Bass, 1998).

A sample item is

The person I am rating avoids getting involved when important issues arise

The MLQ (Form 5X)'s Cronbach's α varies between .91 and .95 (Avolio & Bass, 2004), which indicates a high level of reliability (Cronbach, 1951).

The MLQ (Form 5X) was developed in response to criticism to a formerly used questionnaire (Bass, & Avolio, 1993). First, Avolio and Bass (1998) conducted a series of factor analyses of the MLQ 5R, to identify items with the best convergent and discriminant validities. Second, they (Avolio, & Bass, 1998) used a partial least square analysis to select items to be included in the MLQ 5X. Third, they (Avolio, & Bass, 1998) developed new items to distinguish between charismatic and transformational leadership based on a literature review. Fourth, six scholars of leadership received the MLQ 5X version and made recommendations for item inclusion or exclusion (Avolio, & Bass, 1998). Further, they (Avolio, & Bass, 1998) conducted a series of Confirmatory Factor Analyses and LISREL analytics to identify four items per leadership variable to represent the nine leadership factors (Avolio, & Bass, 1991).

Based on a 2003 normative sample, a confirmatory factor analysis was run (Antonakis, Avolio, & Sivrasubramaniam, 2003). The validity of the nine-factor leadership model was supported (Antonakis et al., 2003). The model was also rated stable within homogenous contexts with following factors: environmental risk, leader-follower gender, gender of leader, and leader hierarchical level (Antonakis et al., 2003).

The database of the current MLQ 5X was used to further analyze data (Avolio, & Bass, 1998). A high correlation between transformational and contingent reward leadership was found (Avolio, & Bass, 1998). The correlations found between Management by exception active is low positive or negative with transformational and contingent reward leadership (Avolio, & Bass, 1998). The correlation found between management by exception passive as laissez-fair and transformational and contingent reward leadership are negative (Avolio, & Bass, 1998).

The validity of transformational leader behavior was supported by Carless (1998). Rowold and Heinitz (2007) confirmed convergent validity between charismatic and transformational leadership, but they report as a key finding that charismatic leadership style does not augment transactional leadership and transformational leadership does. Also, their study provided evidence that transformational leadership explains performance ratings over and above transactional leadership. Muenjohn and Armstrong (2008) conducted a confirmatory factor analysis and stated that the nine-factor leadership model might be the best to capture the construct factors of transformational and transactional leadership.

Respect (Dependent Variable Question 1 and Mediating Variable Questions 4, 5, and 6).

Van Quaquebeke and Eckloff (2010) defined respect as an attitude to others justifying attention and behavior which returns in the targeted person appreciation in worth and importance. During the literature review, the lean principle of respect for people was documented. As this principle seems to be a foundational element of lean, it was measured how subordinates feel respected by their superiors.

Based on their definition, Van Quaquebeke and Eckloff (2010) developed a 12-item survey by identifying 149 statements and creating 19 categories through conducting qualitative research based on 426 participants. Additionally, they conducted two more studies to empirically derive feasible measurement items (Van Quaquebeke, & Eckloff, 2010). They investigated all items of the 149 statements with a minimum of ranking 6 (scale 1 to 7) and with a high correlation to the respectful leadership marker (Van Quaquebeke, & Eckloff, 2010). After finding 12 items, they investigated the

psychometric qualities of them (Van Quaquebeke, & Eckloff, 2010). They conducted a principal component factor analysis, discriminatory power cores were calculated, and they claimed that their survey assesses the construct of respectful leadership well (Van Quaquebeke, & Eckloff, 2010). They reported a Cronbach's α between .95 and .96, which indicates a high level of reliability (Cronbach, 1951).

The Respectful Leadership Scale developed by van Quaquebeke and Eckloff (2010) is rated on a 5-point Likert scale from 0 (not at all), 1 (once in a while), 2 (sometimes), 3 (fairly often), and 4 (frequently, if not always). A sample item is (all items Appendix A);

Trust my ability to independently and self-reliantly perform well

Wong, Tjosvold, and Khong (2016) suggested that respectful leaders enable followers to manage conflicts cooperatively, which supports construct validity.

A limitation in the validity of this construct is that Van Quaquebeke's and Eckloff's (2010) studies were conducted in Germany. Other cultures might define respectful leadership differently. In this study organizations in North America shall be measured. These are western cultures and following Hofstede (2001) they seem to be comparable. Power distance was 35 for Germany and 40 for the USA, Masculinity was 66 for Germany and 62 for the USA, Uncertainty Avoidance was 65 for Germany and 46 for the USA, and Individualism was 67 for Germany and 91 for the USA.

Proactivity (Dependent Variable Questions 3, 5 and Mediating Variable Question 6).

Bandura (2001) suggested that human activity is intentionally driven by action and individuals have the opportunity to change their surroundings. Based on Bandura's

thought, Bateman and Crant (1993) defined a proactive personality scale as the ability to intentionally and directly change current circumstances, social or nonsocial. Proactive individuals might exhibit behaviors of problem finding and idea championing (Maynes, McCall & Kaplan, 1985), innovating (Hirschman, 1970), task revision (Staw, & Boettger, 1990), and affect change (Grant, & Ashford, 2008). The second basic principle of lean is continuous improvement. An assumption was that proactive individuals are needed to achieve continuous improvement as the latter requires constant change and the former seems to foster the same. Leadership style might allow proactive employees or not.

Bateman and Crant (1993) developed a 17-item proactive scale and report a Cronbach's $\alpha = .89$, which indicates a good level of reliability (Cronbach, 1951).

Seibert, Crant, and Kraimer (1999) used a modified proactive personality scale and reported a Cronbach's alpha of .85. They verified the validity of the shortened 10-item scale through a pre-test of 181 MBA undergrad students. After eliminating seven items from the scale, they reported a difference of Cronbach's alpha of 0.02 and concluded that the shortened version appeared to be comparable. The shortened scale has been used in this study to ease the burden of the study subjects to answer an already long survey.

The proactive scale uses a Likert scale from 1 to 5. Because other data requires a different Likert scale the following scale shall be used: 0 to 4, step 1 from (0) strongly disagree, (1) disagree, (2) neutral, (3) agree, (4) strongly agree.

A sample item is (all items Appendix A)

When I have a problem, I tackle it head-on

Bateman and Crant (1993) conducted three studies to assess the scale's psychometric properties. Factor analysis supported the uni-dimensionality of the scale (Bateman, & Crant, 1993). A moderate correlation with the need for achievement and dominance supported a convergent validity (Bateman, & Crant, 1993). Locus of control was not significantly correlated to proactive personality supporting discriminant validity (Bateman, & Crant, 1993). A limiting factor might be that the participants in their samples were all students even though in one sample the participants were MBA students. In the suggested study the participants will be employees who may or may not have studied and likely are from a different age range. They reported discriminant validity between the proactive scale and age, sex, years of work experience, locus of control, private self-consciousness, intelligence, agreeableness, neuroticism, and openness (Bateman, & Crant, 1993).

The proactive personality scale was used in a research model to connect proactivity personality and job search within graduating college students, but the validity of the proactive personality scale was not discussed. (Brown, Kane, Cober, Levy, & Shalhoop, 2006).

Crant (1995) provided evidence for the criterion validity of the proactive personality scale by conducting a hierarchical regression with several control variables. The proactive personality scale provided a significant 8% variance explanation (Crant, 1995).

Eby, Butts, and Lockwood, 2003, conducted a study using following predictors: proactive personality, openness to experience, career insight, experience with a mentor, internal networks, external networks, career/job-related skills, and career identity. All

predictors were significantly correlated to three criteria, further supporting criterion validity (Eby, Butts, & Lockwood, 2003).

Seibert, Kraimer, and Crant, 2001, used the shortened 10-item scale in a longitudinal study to research the connection between proactive personality and salary progression, promotions in past two years, and career satisfaction in a structured equation model analysis. They reported significant relations, further supporting the criterion validity of the proactive personality scale (Seibert, Kraimer, & Crant, 2001).

Zhou and Shi (2009) discussed the construct validity by focusing on validating a Chinese translation of the 10-item scale. They used following measurements: proactive personality scale, big five factors, political skill, career satisfaction, job performance, and general self-efficacy (Zhou, & Shi, 2009). They conducted an exploratory factor and confirmatory factors analysis and concluded that the one-factor model is acceptable for the 10-item scale (Zhou, & Shi, 2009). They computed Pearson correlation coefficients between the total scores of the Chinese translation and other related measures and conducted two-tailed significant tests to confirm construct validity (Zhou, & Shi, 2009). They conducted a hierarchical regression to verify the ability of proactive personality to predict career satisfaction and job performance and report support for criterion validity (Zhou, & Shi, 2009).

Yang and Chau (2016) conducted a study about the relationship between proactive personality and career success mediated by the leader-member exchange. They used hierarchical regression, a moderated path analysis, and a Monte-Carlo simulation to confirm the relationship (Yang, & Chau, 2016) providing further evidence of criterion validity.

Innovative Work Behavior (Dependent Variable Questions 2, 4, and 6)

Innovative Work Behavior (IWB) is defined through individual employees who “develop, carry, react to, and modify ideas” (Van de Ven, 1986, p. 592) and the root source, ideas (Scott, & Bruce, 1994). Janssen (2000) developed a 9-item scale based on the works of Scott and Bruce (1994), individual innovative behavior, and Moss Kanter (1988), stages of innovation. Janssen (2000) suggested three items per each concept, idea promotion, idea generation, and idea realization. Janssen (2000) distinguished between “self-rated” and “leader-rated” scores and preferred to only use the “self-rated” scores due to following three reasons: 1. The cognitive representation and reports on ones on Innovative Work Behavior might be better due to the knowledge about one’s own work. 2. The assessment of the IWB is a subjective performance appraisal. 3. Supervisors might miss genuine innovative activities not reported. Intercorrelation between the three concepts of IWB was reported to be between .76 and .85 for self-reports (Janssen, 2000).

During the literature review, constructs were identified, which foster innovative work behavior. These are 1. Asking why not who, trying to promote innovation through identifying root problems and therefore generating ideas to solve the root problem. 2. Training of employees about problem-solving tools, employees shall be enabled to innovate in a constructive manner learning new ways to analyze and solve problems.

Janssen’s (2000) 9-item scale has nine items on a Likert scale from 1 = never to 7 = always. Because other data requires a different Likert scale the following scale shall be used: 0 to 4 step 1 from (0) never, (1) rarely, (2) sometimes, (3) frequently, to (4) always. An example item is (all items Index A);

Do you create new ideas for difficult issues?

Ramamoorthy, Flood, Slattery, and Sardessai (2005) used the Janssen scale but modified the scale to a five-point Likert scale. They developed a model connecting meritocracy, justice perceptions, pay, job autonomy with met expectations, obligation to innovate with IWB and used Padhazur's method to derive path coefficients and reported significant relationships between constructs (Ramamoorthy, Flood, Slattery, & Sardessai, 2005). Their research supports criterion validity.

Stock (2015) used a reduced scale of 5-items due to the service environment of her study and excluded items related to idea promotion. To verify the reliability and validity, an exploratory and confirmatory factor analysis were conducted; Cronbach's α exceeding .7, passing recommended values (Bagozzi, Yi, & Philipps, 1991; Nunnally, & Bernstein, 1978) and a composite reliability of greater than .6, passing the threshold value (Bagozzi, Yi, & Philipps, 1991), were reported (Stock, 2015). Stock (2015) reported a pass for a test of discriminant validity following Fornell and Larcker's (1981) criterion.

Janssen's (2000) reported a Cronbach's $\alpha = .95$, which indicates a high level of reliability (Cronbach, 1951). For another scale based on Scott and Bruce (1994) work, a Cronbach's $\alpha = .89$ (Scott, & Bruce, 1994), a Cronbach's $\alpha = .76$ (Chen, & Aryee, 2007), and a Cronbach's $\alpha = .87$ (supervisor rating) / $.86$ (self-rating) (Carmeli, Meitar, & Weisberg, 2006) were reported. These results indicate that Janssen's scale seems to be better.

Organization and Gender (Control Variable).

A nominal variable Organization was used to account for possible within-organization effects on the independent variables. Schein (1985b) proposed that an organization has an influence on the culture of a unit, and Mann (2008) proposed that the

top leader of an organization influences the culture of the same. As this study will focus on the unit level, the organization's influence shall be controlled.

A nominal variable gender (female =1 / male = 0) will be used to account for possible gender effects on the independent variables. Avolio and Bass (1998) stated that gender might affect the leadership style variable.

Reliability of Scales.

For the three scales not so frequently used, Respect, Proactivity, and Innovative Work Behavior, I used Cronbach's alpha method (Cronbach, 1951) to estimate the reliability of the scales used. For values above 0.9, the reliability is excellent, between 0.8 and 0.9 good, and between 0.7 and 0.8 acceptable.

Procedure

Preparation of Survey.

The company Mind Garden agreed to enhance the MLQ-survey by the three suggested surveys against payment. Therefore, only one survey with all items was deployed instead of four different surveys.

Data Collection.

The participating organizations had defined the to-be-analyzed leaders and their hierarchical level. The corresponding empty table to collect data is attached in Appendix B.

The survey was administered through the MLQ 5X software TransformTM. A customization of the MLQ 5X was done to include the three other instruments to the

MLQ 5X survey tool (Avolio, & Bass, 1998; Respectful Leadership Scale tool (Van Quaquebeke, & Eckloff, 2010; see Appendix A); Innovative Work Behavior tool (Janssen, 2000; see Appendix A); Proactive scale tool (Bateman, & Crant, 1993; see Appendix A). Additionally, the survey was translated by language experts into German and Spanish.

The identified leaders received a leadership MLQ. The leaders sent via the MLQ online tool emails to their superior(s), same level colleagues, and their subordinates. Then all these contacted employees answered the enhanced MLQ regarding the leadership style of the leader. This technique is called 360-degree feedback.

MLQ 5X software TransformTM provided the data values for all variables per survey participant. The software aggregated the data per leader for all leadership style variables. The data for Respect, Proactivity and IWB were collected for all leaders by the subordinates, peers, and superiors identified by them.

Data Preparation.

The participating leaders were separated into three levels: top-level business unit leaders, low-level leaders with direct supervision of employees and workers but no indirect supervised personnel, and mid-level, all other leaders. Only mid-level leaders were included in this study.

Only if a minimum of three other people rated the leader on the MLQ 5X, the leader's data was used in the data analysis section (Avolio, & Bass, 1998). Who these three people were was irrelevant as long as they were directly connected to the leader (Avolio, & Bass, 1998). The reason for setting the threshold at three is that Avolio and Bass (1998) present such a ratio for the construct validity of the MLQ 5X.

Only if a minimum of three subordinates participated in the enhanced MLQ 5X of the leader, the variables Respect, Innovative Work Behavior, and Proactivity were connected to the leader's leadership style. For the measurement of the dependent variables, no minimum amount of answers is suggested by the respective authors, but the same criterion as for the MLQ seemed reasonable. The middle leaders received five leadership style scores through the MLQ. The scores for Respec, Proactivity, and Innovative Work Behavior were calculated by taking the average of only the subordinates.

Data Outlier Analysis.

A test for outliers was conducted by checking three criteria (Cohen, Cohen, West & Aiken, 2013): 1. Leverage, 2. Influence on Data and 3. Discrepancy.

1. Leverage: SPSS reported the centered leverage value (Cohen et al., 2013).

Due to the number of potential participants of over 30, I assumed a small size sample. This allows a cut-off value of $3k/n$ with k number of independent variables and n number of cases (Cohen et al., 2013). The identified cases might be outliers.

2. Influence of data: I will use Cook's D_i to identify the global influence of a case (Cohen et al., 2013). Assuming a small sample again, the cut-off value for Cook's distance is > 1 (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).
3. Discrepancy: Externally studentized residuals is a preferred measure of discrepancy (Cohen et al., 2013). SPSS terminology for externally studentized residuals is "studentized Deleted Residual" (Cohen et al., 2013). Following Cohen, Cohen, West, and Aiken (2013) data analysts used cut-off values from

2.0 to 4.0 in large samples to reduce the number of potential outliers. I will keep the number of possible outliers below 3.

I plotted Cook's D against the centered leverage value while identifying each data point with a label. If Data points are singular Cook's D scale and/or above the calculated threshold for centered leverage value, I considered the data point as a potential outlier (Cohen et al., 2013). I plotted "Case ID" and "Studentized Deleted Residual" with SPSS. By looking at the cut-off line, I identified potential outliers (Cohen et al., 2013).

If a data point passes all three criteria, I excluded it from the statistical analysis. If one data point passed two tests in a rather strong manner, I paid special attention to it and decided case-by-case if it was excluded or not.

Regression Assumption Analysis.

Now I could start to verify the assumptions for regression:

1. Normality of the dependent variable

I used the Kolmogorov-Smirnov and Shapiro-Wilk tests to verify this assumption (Lomax & Hahs-Vaughn, 2012).

2. Independence

I verified the residual plots of studentized residuals with unstandardized predicted values and all used independent variables. No pattern should be visible, and the values should fall within a band from -2 to 2 (Lomax & Hahs-Vaughn, 2012).

There is a risk of violating this assumption in the suggested study as data was gathered in blocks (plants). As a criterion, I used the Durbin-Watson test. The results should not be below 1 or above 3.

3. Homogeneity of Variance

The created plots were used to verify the spread of the studentized residuals, which should be fairly constant (Lomax & Hahs-Vaughn, 2012).

4. Linearity

I produced multiple scatter plots between all variables. By looking at the produced scatter plots, I was able to confirm this assumption if I observed only linear or random patterns (Lomax & Hahs-Vaughn, 2012). Additionally, I verified the residual plots again by observing the lowess line, which should show no pattern (Cohen et al., 2013).

5. Normality

I plotted the Q-Q scatterplot of unstandardized residuals. The points should fall on along a straight diagonal line (Lomax & Hahs-Vaughn, 2012). I noted the descriptive statistics. The skewness and kurtosis of the data should be outside the range from -2 to 2 (Lomax & Hahs-Vaughn, 2012). I printed the frequency histogram, and a normal distribution should be observable (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). I created a box-plot and used the tests of normality from Kolmogorov-Smirnov and Shapiro-Wilk to verify the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

6. Fixed X

As I excluded missing data, all x values had fixed values, and all predicted data will be only on the scale from 0 to 4. Thus, the assumption was passed (Lomax & Hahs-Vaughn, 2012).

7. Multicollinearity

The VIF should be lower than 10 (Lomax & Hahs-Vaughn, 2012). However, Cohen et al. (2013) suggested that this general belief might be too high for behavioral science, yet they do not provide any other threshold. Additionally, I reviewed the corresponding regression model(s) if the eigenvalues of the predictors were close to 0. If the model consisting of the predictor variable with low eigenvalue as the dependent variable and the other predictor variable(s) as the independent variable(s) produced an R^2 below 0.9, it suggests that multicollinearity is not an issue (Lomax & Hahs-Vaughn, 2012).

Data Analysis

Quantitative analyses were conducted to describe the relationships between the dependent and independent variables. First multiple regressions based on the five leadership style variables and the three dependent variables were conducted. Then two mediation models and five double mediation analysis were analyzed.

Multiple Regression Models.

The first three research questions required multi-variate regressions.

1. Do leaders with transformational leadership style score higher on respect than other leadership styles at manufacturing organizations in North America?

H₁₀: There is no statistically significant relationship between the leadership style and respect.

H_{1a}: There is a statistically significant relationship between the leadership style and respect.

The basic model is

Leadership Style \longrightarrow Respect

The multiple linear regression model is (Lomax & Hahs-Vaughn, 2012)

$$Respect = \beta_{Respect_j} Leadership Style_{j_i} + \alpha_{Respect Leadership Style} + \varepsilon_i$$

Where

Respect is the criterion variable

Leadership Style_j are predictor variables (TL, CR, MBEA, MBEP, LF)

$\beta_{Respect_j}$ are the slopes for *Respect* predicted by *Leadership Style_j*

$\alpha_{Respect Leadership Style}$ is the intercept for *Respect* predicted by

Leadership Style

ε_i are the population residuals or errors of prediction

i represents an index for a particular case with 1 to *n* participants in this study

j represents an index for the five different leadership styles in this study.

According to Pedhazur (1997), it is preferable to use the non-standardized values for the variables to receive a more consistent prediction. The least square criterion is used to find the regression line. With the help of an F-Statistic, the significance of the model was verified. The multiple *r* squared value was verified to indicate how much variation was predicted by the *x* variables. The significance of the slopes' coefficients were verified by using a *t*-statistic. The unstandardized and standardized slopes, the confidence interval (CI) around the unstandardized slope, the intercept and its significance (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013), and the estimated power as calculated by

G*Power 3.1.9.2 (Faul, Erdfelder, Buchner, & Lang, 2007) were noted. With the help of this verification, the hypothesis was rejected or not rejected.

2. Do leaders with transformational leadership styles score higher on innovative work behavior (IWB) than other leadership styles at manufacturing organizations in North America?

H2₀: There is no statistically significant relationship between the leadership styles and innovative work behavior.

H2_a: There is a statistically significant relationship between the leadership styles and innovative work behavior.

The model is

Leadership Style \longrightarrow Innovative Work Behavior (IWB)

The multiple linear regression model is (Lomax & Hahs-Vaughn, 2012)

$$IWB = \beta_{IWB_j} Leadership Style_{j_i} + \alpha_{IWB Leadership Style} + \varepsilon_i$$

Where

IWB is the criterion variable

Leadership Style_j are predictor variables

β_{IWB_j} are the slopes for *IWB* predicted by *Leadership Style_j*

$\alpha_{IWB Leadership Style}$ is the intercept for *IWB* predicted by *Leadership Style*

ε_i are the population residuals or errors of prediction

i represents an index for a particular case with 1 to *n* participants in this study

j represents an index for the five different leadership styles in this study.

According to Pedhazur (1997), it is preferable to use the non-standardized values for the variables to receive a more consistent prediction. The least square criterion is used to find the regression line. With the help of an F-Statistic, the significance of the model was verified. The multiple r squared value was verified to indicate how much variation was predicted by the x variables. The significance of the slopes' coefficients were verified by using a t-statistic. The unstandardized and standardized slopes, the confidence interval (CI) around the unstandardized slope, the intercept and its significance (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013), and the estimated power as calculated by G*Power 3.1.9.2 (Faul et al., 2007) were noted. With the help of this verification, the hypothesis was rejected or not rejected.

3. Do leaders with transformational leadership style score higher on proactivity of employees than other leadership styles at manufacturing organizations in North America?

H3₀: There is no statistically significant relationship between the leadership style and proactivity of employees.

H3_a: There is a statistically significant relationship between the leadership style and proactivity of employees.

The model is

Leadership Style  Proactivity

The multiple linear regression model is (Lomax & Hahs-Vaughn, 2012)

$$Proactivity = \beta_{Proactivity_j} Leadership Style_{j_i} + \alpha_{Proactivity Leadership Style} + \varepsilon_i$$

Where

Proactivity is the criterion variable

Leadership Style_j are predictor variables

$\beta_{Proactivity_j}$ are the slopes for *Proactivity* predicted by *Leadership Style_j*

$\alpha_{Proactivity Leadership Style}$ is the intercept for *Proactivity* predicted by *Leadership Style_j*

ε_i are the population residuals or errors of prediction

i represents an index for a particular case with 1 to *n* participants in this study

j represents an index for the five different leadership styles in this study.

According to Pedhazur (1997), it is preferable to use the non-standardized values for the variables to receive a more consistent prediction. The least square criterion is used to find the regression line. With the help of an F-Statistic, the significance of the model was verified. The multiple *r* squared value was verified to indicate how much variation was predicted by the *x* variables. The significance of the slopes' coefficients were verified by using a *t*-statistic. The unstandardized and standardized slopes, the confidence interval (CI) around the unstandardized slope, the intercept and its significance (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013), and the estimated power as calculated by G*Power 3.1.9.2 (Faul et al., 2007) were noted. With the help of this verification, the hypothesis was rejected or not rejected.

Mediation Models.

Simple Mediation Models.

For the next questions, the variable Respect was converted into a mediator variable.

4. Does a mediation effect exist between transformational leadership and proactivity mediated by respect?

H4₀: Respect does not mediate the relationship between Transformational Leadership and Proactivity.

H4_a: Respect does mediate the relationship between Transformational Leadership (TL) and Proactivity.

The model is:



The analytical approach is based on the work of Baron and Kenny (1986), who distinguished between moderators and mediators. They provided the analytic procedure used here. The mediator respect could be the carrier of the effect leadership style on proactivity. To do so, I used the SPSS Add-On “Process 3.0” from Andrew F. Hayes and followed Sobel’s approach (1982) and a bootstrapping technique suggested by Hayes (2013) to verify the mediation results.

Sobel (1982) suggested a method to assess the significance of indirect effects (in this case mediation) based on the variance-covariance matrix of the coefficients to compute the matrix of partial derivatives and the estimated asymptotic variance-covariance matrix of the indirect effect. Hayes (2017) suggested using random sampling

with replacement (aka bootstrapping) to assign a measure of accuracy (confidence interval) for the indirect effect. Both authors suggested methods to provide evidence if an indirect effect (mediation) is statistically supportable.

A regression was conducted between TL and Proactivity, a regression between TL and Respect, and a multiple regression between TL and Respect on Proactivity.

According to Pedhazur (1997), it is preferable to use the non-standardized values for the variables to receive a more consistent prediction. To find the regression lines, the least square criterion was used. With the help of an F-Statistic, the model's significance was verified (Hayes, 2017). Multiple r squared was noted to indicate how much variation was predicted by the x variables (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). The significance of the slopes coefficients was verified by using a t-statistic (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

The regression between transformational leadership style and proactivity had to be significant (Hayes, 2017). The regression between Transformational Leadership and Respect had to be significant (Hayes, 2017). The multiple regression between transformational leadership style and respect on proactivity had to be significant (Hayes, 2017). The effect of transformational leadership style on proactivity had to be not significant in the multiple regression (Hayes, 2017). In all cases, the F-test was used to verify the significance of the regression models and the t-test for the coefficients significance in the multiple regression (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). Additionally, this procedure allowed to receive the slopes of the regression lines between transformational leadership and respect, respect and proactivity,

transformational leadership and proactivity, and finally the multiple regression between transformational leadership style and respect on proactivity (Hayes, 2017).

With the help of the slopes and standard errors, a z-score = $\frac{ab}{s_{ab}}$ was calculated to test if the indirect effect was significant or not (Sobel, 1982). Additionally, a bootstrapping approach was used to verify the significance of the mediation model as suggested by Hayes (2017). If the confidence interval did not include 0, a significant indirect coefficient was assumed (Hayes, 2017).

5. Does a mediation effect exist between transformational leadership (TL) and innovative work behavior (IWB) mediated by respect?

H5₀: Respect does not mediate the relationship between Transformational Leadership and Innovative Work Behavior.

H5_a: Respect does mediate the relationship between Transformational Leadership and Innovative Work Behavior.

The model is:



The analytical approach is based on the work of Baron and Kenny, (1986). The mediator respect could be the carrier of the effect leadership style on Innovative Work Behavior. To do so, I used the SPSS Add-On “Process 3.0” from Andrew F. Hayes to follow Sobel’s approach (1982) and a bootstrapping technique suggested by Hayes (2017).

A regression was conducted between TL and Innovative Work Behavior, and between TL and Respect, and a multiple regression between TL and Respect on Innovative Work Behavior. According to Pedhazur (1997), it is preferable to use the non-standardized values for the variables to receive a more consistent prediction.

To find the regression lines, the least square criterion was used. With the help of an F-Statistic, the model's significance was verified (Hayes, 2017). Multiple r squared was noted to indicate how much variation was predicted by the x variables (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). The significance of the slopes coefficients was verified by using a t-statistic (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

The regression between transformational leadership style and Innovative Work Behavior had to be significant (Hayes, 2017). The regression between Transformational Leadership and Respect had to be significant (Hayes, 2017). The multiple regression between transformational leadership style and respect on Innovative Work Behavior had to be significant (Hayes, 2017). The effect of transformational leadership style on Innovative Work Behavior had to be not significant in the multiple regression (Hayes, 2017). In all cases, the F-test was used to verify the significance of the regression models and the t-test for the coefficients' significance in the multiple regression (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). Additionally, this procedure allowed to receive the slopes of the regression lines between transformational leadership and respect, respect and Innovative Work Behavior, transformational leadership and Innovative Work Behavior, and finally the multiple regression between transformational leadership style and respect on Innovative Work Behavior (Hayes, 2017).

With the help of the slopes and standard errors, a z-score = $\frac{ab}{s_{ab}}$ was calculated to test if the indirect effect was significant or not (Sobel, 1982). Additionally, a bootstrapping approach was conducted to verify the significance of the mediation model as suggested by Hayes (2017). If the confidence interval did not include 0, a significant indirect coefficient was assumed (Hayes, 2017).

Double Mediation Models.

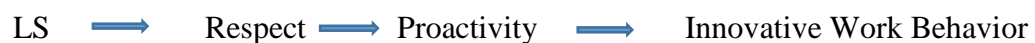
Five double mediation models were run based on the Leadership Style (LS) independent variables. Here only one basic hypothesis is presented using Leadership Style to represent all five leadership styles presented, Transformational Leadership, Contingent Reward, Management by Exception Active, Management by Exception Passive, and Laissez Fair.

6. Do double mediation effects exist between one of the five leadership styles and innovative work behavior mediated by respect and proactivity?

H₆₀: Respect and Proactivity do not mediate the relationship between Leadership Style (LS) and Innovative Work Behavior.

H_{6a}: Respect and Proactivity do mediate the relationship between Leadership Style (LS) and Innovative Work Behavior

The model is:



The analytical approach is based on the work of Baron and Kenny, (1986). The mediators Respect and Proactivity could be the carriers of the effect Leadership Style on

Innovative Work Behavior. To do so, the SPSS Add-On “Process 3.0” from Andrew F. Hayes was used to follow a bootstrapping technique suggested by Hayes (2017).

A regression was conducted between the independent variable Leadership Style and the dependent variable Innovative Work Behavior. This regression had to be significant (Hayes, 2017) to support double mediation. A regression was conducted between the independent variable Leadership Style and dependent variable Respect. This regression has to be significant (Hayes, 2017) to support double mediation. According to Pedhazur (1997), it is preferable to use the non-standardized values for the variables to receive a more consistent prediction. To find the regression lines, the least square criterion was used. With the help of an F-Statistic, the significance of the model was verified (Hayes, 2017). Multiple r squared was noted to indicate how much variation was predicted by the x variables (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). The significance of the slopes coefficients was verified by using a t-statistic (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

A multivariate regression was conducted between the independent variables Leadership Style, Respect and dependent variable Proactivity. The path between Leadership Style and Proactivity had to be not significant, but the path between Respect and Proactivity had to be significant to support double mediation (Hayes, 2017). The F-test was used to verify the significance of the regression models and the t-test for the coefficients significance in the multiple regression (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

A multivariate regression was conducted between the independent variables Leadership Style, Respect, Proactivity and the dependent variable Innovative Work

Behavior. The path between Leadership Style and Innovative Work Behavior had to be not significant to support double mediation (Hayes, 2017). The path between Respect and Innovative Work Behavior had to be not significant to support double mediation (Hayes, 2017). The path between Proactivity and Innovative Work Behavior has to be significant to support double mediation (Hayes, 2017). The F-test was used to verify the significance of the regression models and the t-test for the coefficients' significance in the multiple regression (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

A bootstrapping approach was conducted as suggested by Hayes (2017) to verify the significance of the paths. If the confidence interval of 95% did not include 0, a significant indirect coefficient was assumed (Hayes, 2017).

Sample Size.

Multiple Regression.

G*Power 3.1.9.2 (Faul et al., 2007) was used to conduct an a priori power analysis for a linear multiple regression with fixed model and R^2 deviation from zero with 5 independent variables. G*Power is a valid method of sample size estimation (Faul et al., 2007). The power analysis indicated 27 participants would yield an 95% chance (power = 0.95) of detecting a large effect size of 0.5 (Lomax & Hahs-Vaughn, 2012). A large effect size was chosen for the study because the theory hints to a strong relationship between Leadership Style and Respect, Proactivity, Innovative Work Behavior. Also, multiple studies using the MLQ and the corresponding leadership styles have revealed large effect sizes regarding other constructs (Avolio, & Bass, 1998). A pilot study was deemed impractical.

Multiple Regression Mediation Models.

G*Power 3.1.9.2 (Faul et al., 2007) was used to conduct an a priori power analysis for a linear multiple regression with fixed model and R^2 deviation from zero with 2 independent variables. G*Power is a valid method of sample size estimation (Faul et al., 2007). The power analysis indicated 32 participants would yield an 95% chance (power = 0.95) of detecting a large effect size of 0.35 (Lomax & Hahs-Vaughn, 2012). A large effect size was chosen for the study because the theory hints to a strong relationship between Transformational Leadership and Respect on Proactivity as Innovative Work Behavior for people. Also, multiple studies using the MLQ and the corresponding leadership styles have revealed large effect sizes regarding other constructs (Avolio, & Bass, 1998). A pilot study was deemed impractical.

Multiple Regression Double Mediation Models.

G*Power 3.1.9.2 (Faul et al., 2007) was used to conduct an a priori power analysis for a linear multiple regression with fixed model and R^2 deviation from zero with 3 independent variables. G*Power is a valid method of sample size estimation (Faul et al., 2009). The power analysis indicated 56 participants would yield an 95% chance (power = 0.95) of detecting a medium effect size of 0.25 (Lomax & Hahs-Vaughn, 2012). A medium effect size was chosen for the study because the theory hints to a relationship between Leadership Style on Respect on Proactivity to Innovative Work Behavior. A pilot study was deemed impractical.

Assumptions and Limitations

The researcher assumed that all raters will provide honest responses. This is a valid assumption as the survey was administered by a third party to all raters so that anonymity was provided and no retribution needed to be feared.

A limitation was that the participants are not selected randomly.

Ethics of this Study

In research, ethical guidelines principles are respect for people, beneficence, justice, and non-maleficence (Fuji, 2012; Muthuswamy, 2013; Wester, 2011). An informed consent section was included in the survey instrument as the first section, see appendix C. Only if the participants clicked on the given consent button, the survey had been administered. Before sending the survey out, the UNM IRB approval was obtained, see appendix C.

CHAPTER 4: ANALYSIS AND RESULTS

Data Collection

A leader was defined as a person who supervises employees and is not responsible for a multiple plant business unit. The data collected about a leader needed to be provided by a minimum of three followers, because only then a leadership style can be defined following the MLQ Handbook.

Organization A identified 30 leaders and Organization B eight, who should have participated in this research. 30 leaders of Organization A participated, but for four leaders the minimum threshold of three raters was not achieved. Eight leaders of Organization B participated, but for two leaders the minimum threshold of three raters was not achieved. All surveys sent out to the 38 leaders were answered, which is a success rate of 100%. All leaders were asked to invite their followers, peers, and supervisors to rate them. They sent out in total 206 surveys. This is called a 360-degree feedback. However, for this analysis, only the data from the followers were used to rate a leader. And a leader only was included if a minimum of 3 followers rated the supervisor. From total 38 potential data points, 32 were achieved due to the minimum threshold of followers. This is a success rate of 84.21%. For being able to create these 32 data points, in total 139 surveys were conducted. Given that a total of 206 surveys were conducted, 67.48% were used in the data. As only two out of 32 data points were female, the gender control variable got dropped.

Data Outlier and Assumption Analysis

Three outlier analyses are provided for the multiple regression models, then two for the mediation models and then five for the double mediation models. Three verifications were conducted for outliers:

A scatter plot showed Cook's D (1st verification) and Centered Leverage Values (2nd verification). Cases which seem to have a larger gap to other cases might be outliers (Cohen et al., 2013). The Centered Leverage cut off value is 0.46875 (cut off value is calculated as suggested by Cohen et al., 2013). An analysis of discrepancy (3rd verification) used a scatter plot between externally studentized residuals (in SPSS Studentized Deleted Residuals) and Case ID. Attention was paid to cases above 2 or below -2 as suggested by Cohen et al., 2013.

If the same case was identified in all three verifications, the case was excluded from the regression analysis. If only two verifications provided positive results, a closer look at the evidence was taken to decide to keep the data point or not, basically verifying how strong the violations of these two verifications were.

For the assumptions of regression, six verifications were conducted. 1. If the dependent variable is normally distributed. 2. If the independence assumption is fulfilled. 3. If the homogeneity of variance assumption is fulfilled. 4. If the linearity assumption is fulfilled. 5. If the normality assumption is fulfilled. 6. If the multicollinearity assumption is fulfilled.

Leadership Styles and Respect.

Leadership Styles and Respect - Outlier Analysis.

The centered leverage value cut-off value was 0.46875 calculated as described in Chapter 3. Case 8 might be an outlier as it is on both criteria (Figure 6) noticeable.

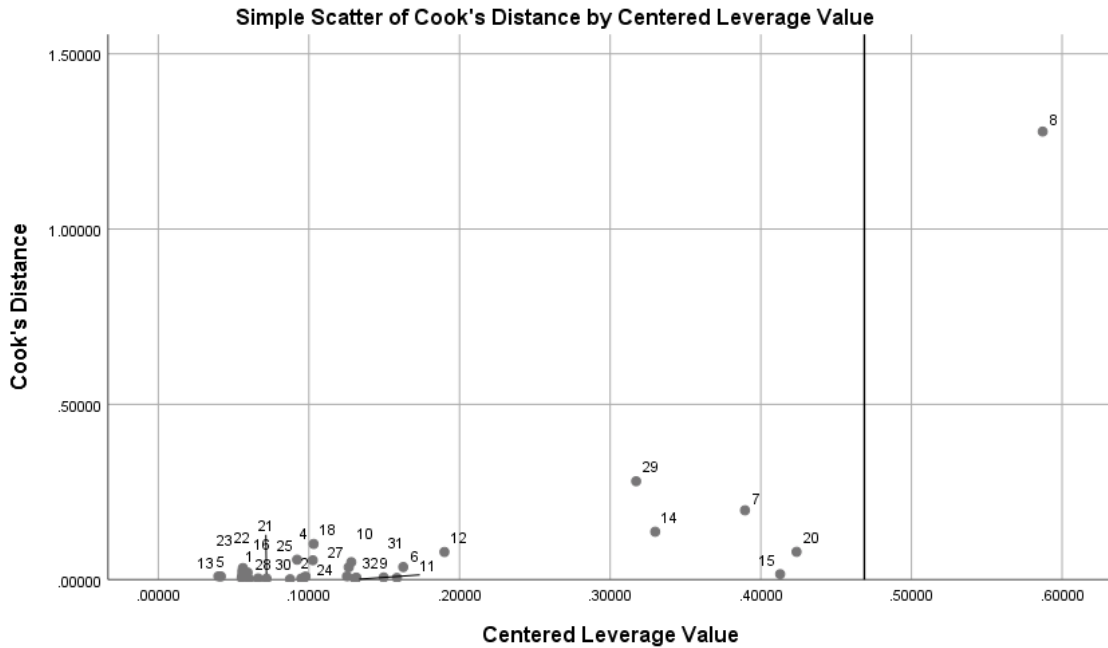


Figure 6: Leadership Styles and Respect, Outlier Cook's D / Centered Leverage

Cases 8 and 18 might be outliers as both values are above the 2.0 threshold (Figure 7).

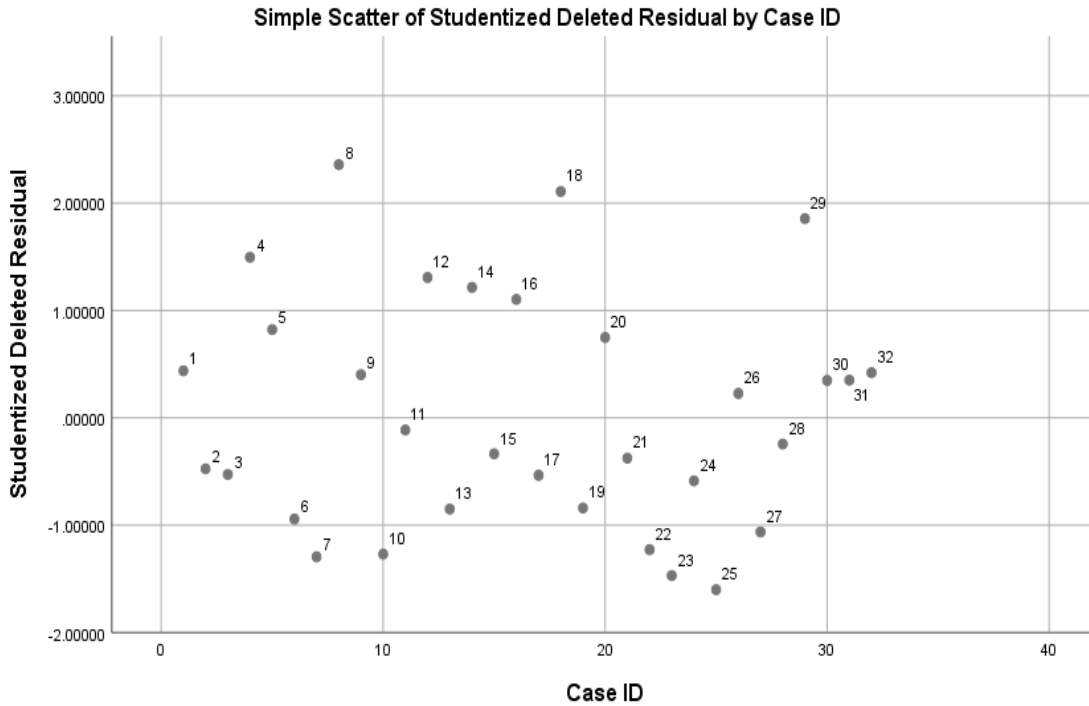


Figure 7: Leadership Styles and Respect, Outlier Externally Studentized residuals
 Case 8 was identified three times as a potential outlier. This is the reason why case 8 was excluded in the following regression analysis.

Leadership Styles and Respect - Assumption Analysis.

Normality of Respect.

Both normality tests (Table 2) were not significant, and the assumption was reasonably fulfilled (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Respect	.087	31	.200*	.973	31	.617

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 2: Leadership Styles and Respect, Normality Assumption

Independence.

In all independence plots (Figure 8 -13), it was observed that the values fell within a band of -2 to 2 on the Y-axis with only one exception, which was always very close to the upper bound line. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

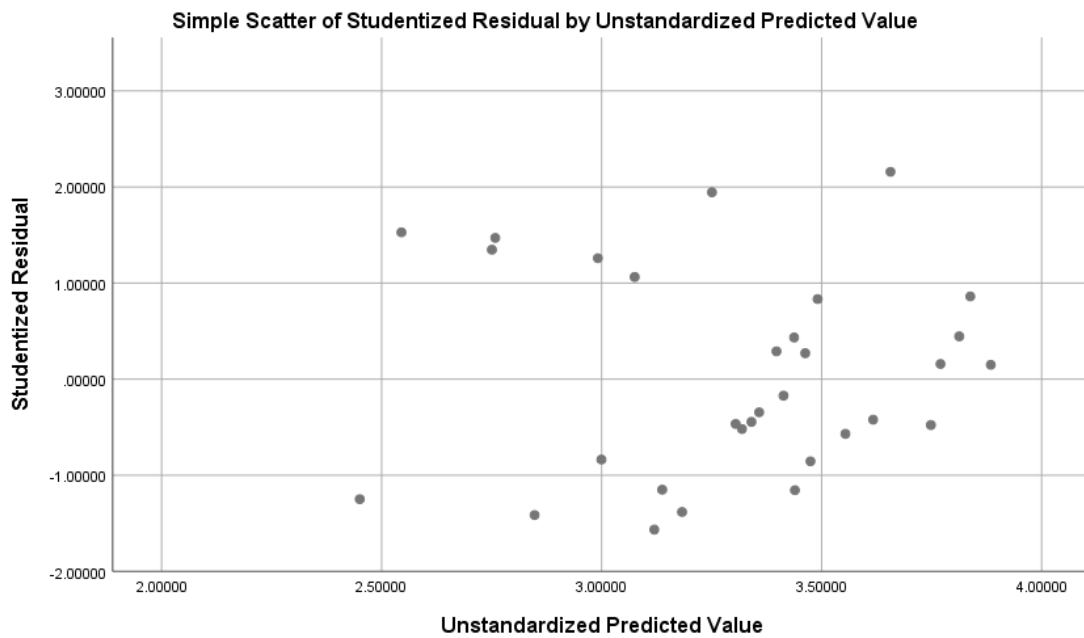


Figure 8: Leadership Styles and Respect – Independence Plot 1

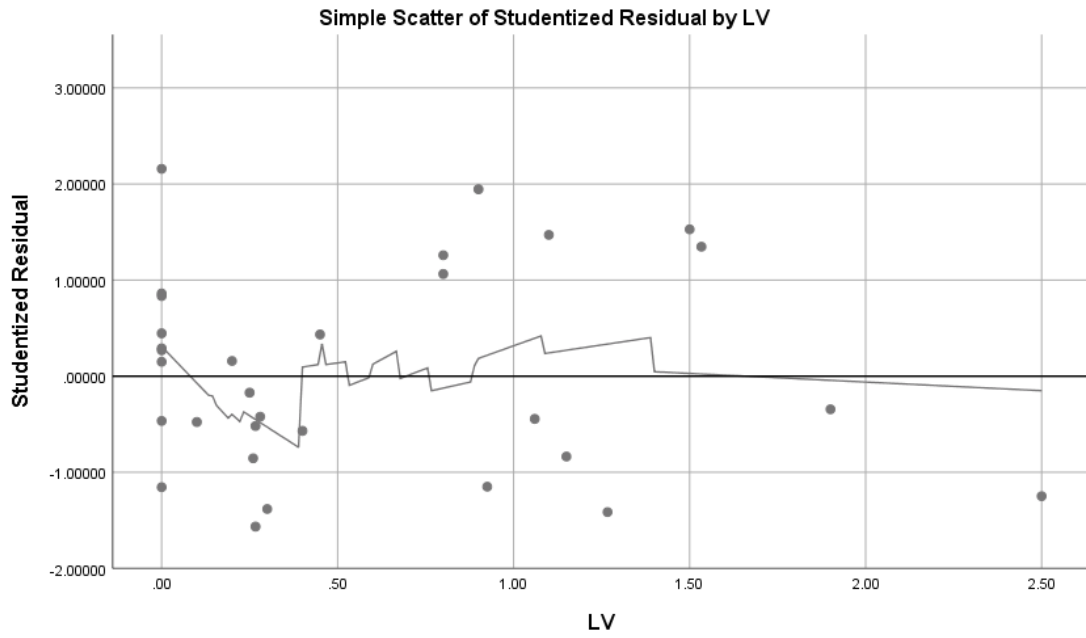


Figure 9: Leadership Styles and Respect – Independence Plot 2

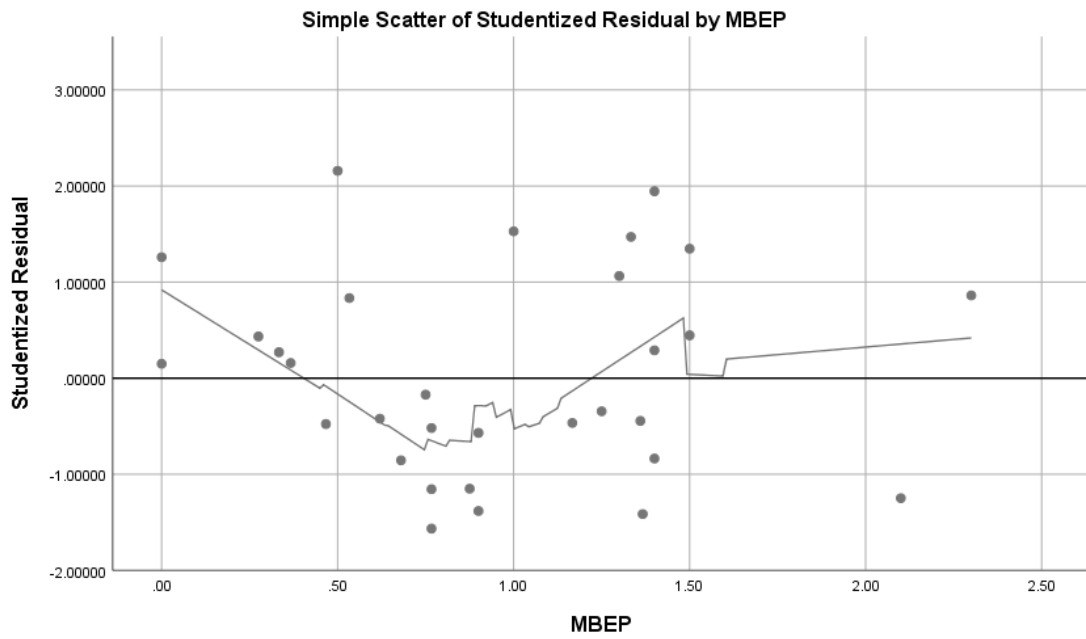


Figure 10: Leadership Styles and Respect – Independence Plot 3

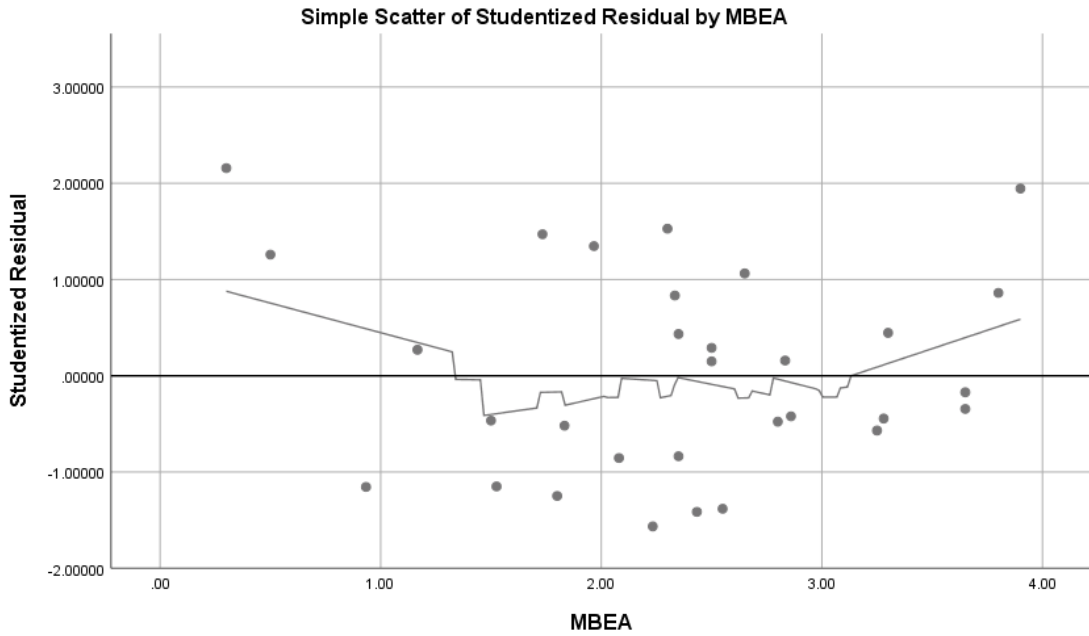


Figure 11: Leadership Styles and Respect – Independence Plot 4

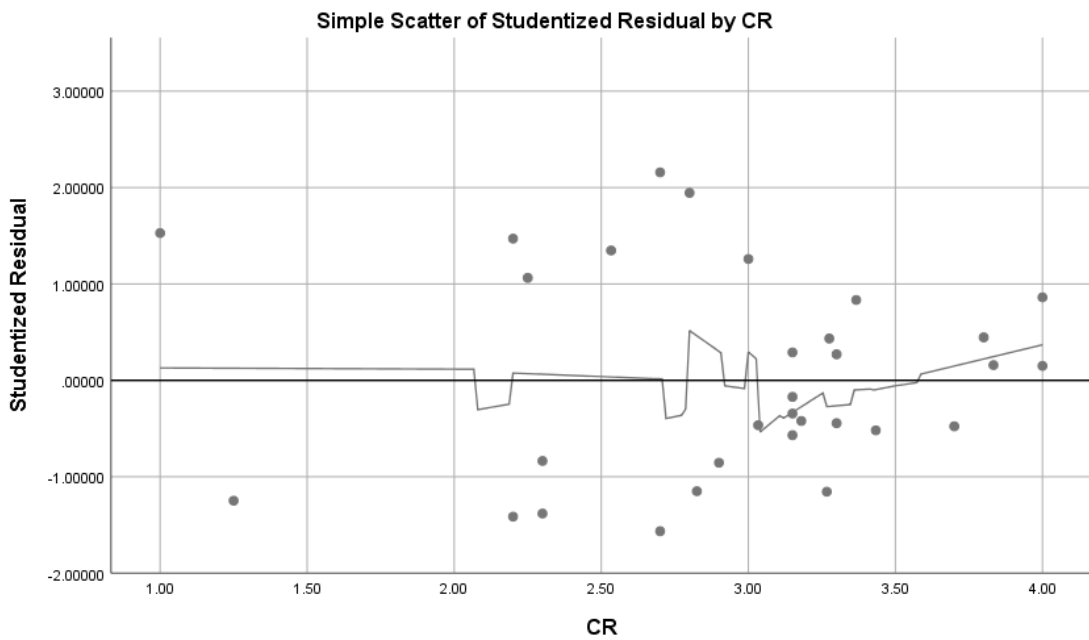


Figure 12: Leadership Styles and Respect – Independence Plot 5

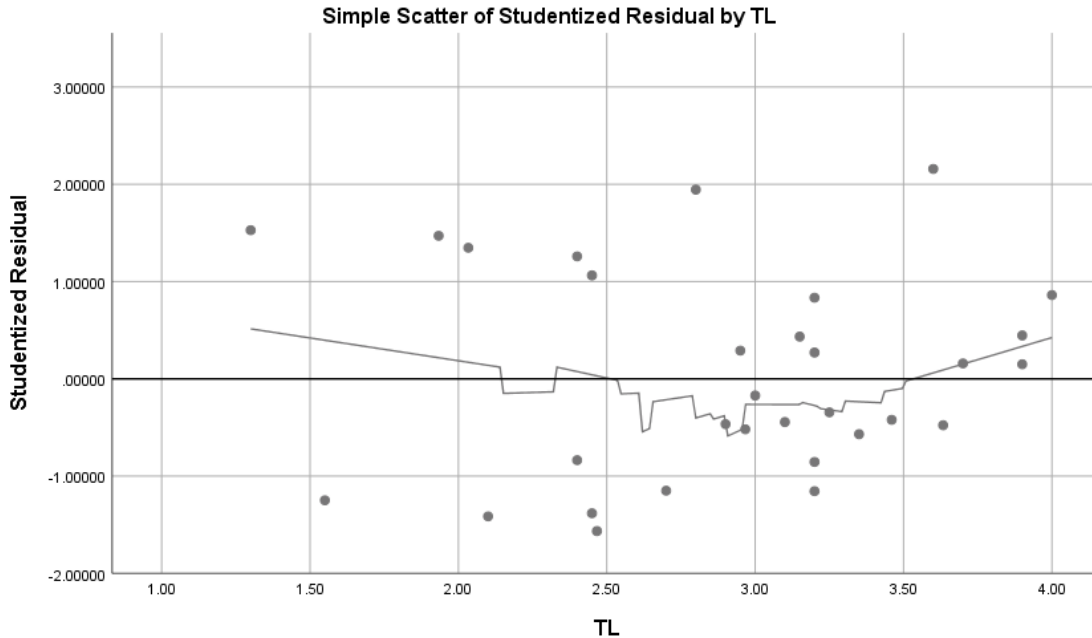


Figure 13: Leadership Styles and Respect – Independence Plot 6

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 8 – 13) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 14) were produced between all independent and dependent variables. Only observe linear or random patterns were observable. Verifying above independence plots 2 to 6, plots 4 and 6 showed a slight power pattern. As the x

and y values were restricted to 0 to 4, and the shown pattern was slight, it was acceptable (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

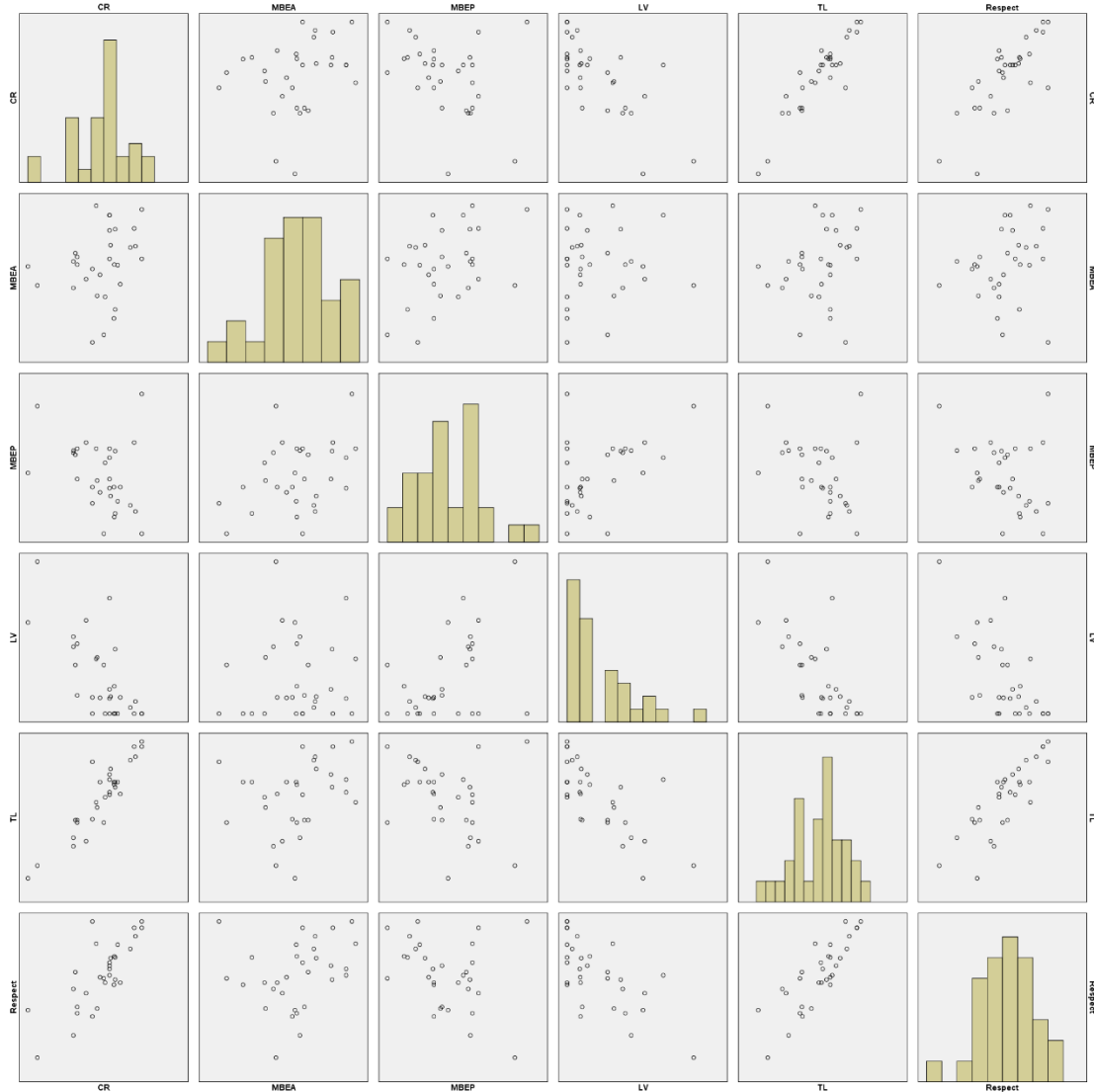


Figure 14: Leadership Styles and Respect – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values followed the line in the normal Q-Q plot (Figure 15) in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

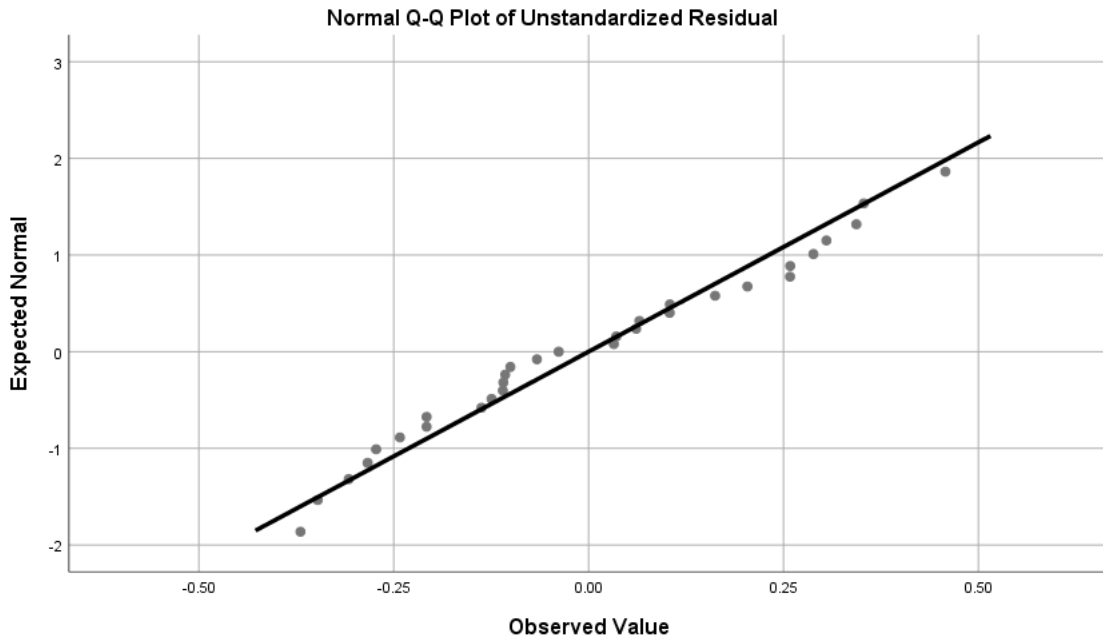


Figure 15: Leadership Styles and Respect – Normality Q-Q Plot

The skewness and kurtosis statistics (Table 3) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.0414	
	95% Confidence Interval for Mean	Lower Bound	-.084	
		Upper Bound	.084	
	5% Trimmed Mean	-.003		
	Median	-.038		
	Variance	.053		
	Std. Deviation	.230		
	Minimum	-.369		
	Maximum	.457		

Range	.827	
Interquartile Range	.411	
Skewness	.221	.421
Kurtosis	-.989	.821

Table 3: Leadership Styles and Respect – Normality Descriptive Statistics

The histogram (Figure 16) of unstandardized residuals reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

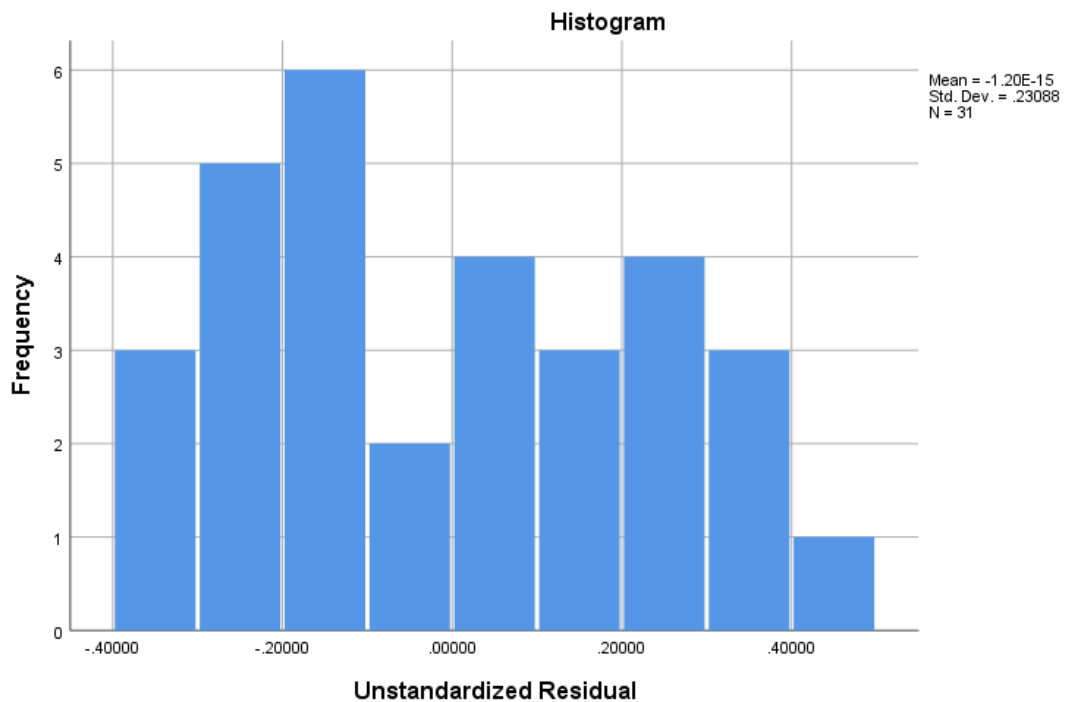


Figure 16: Leadership Styles and Respect – Normality Histogram

Examination of the below boxplot (Figure 17) suggested evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

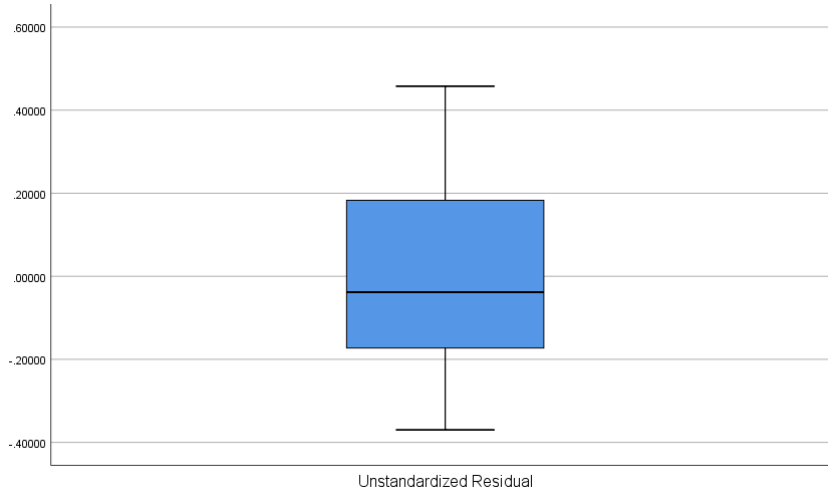


Figure 17: Leadership Styles and Respect – Normality Boxplot

Both tests of normality (Table 4) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.120	31	.200*	.962	31	.330

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 4: Leadership Styles and Respect – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 5) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CR	.152	6.590
	MBEA	.576	1.736

MBEP	.562	1.781
LV	.368	2.719
TL	.145	6.917
Group	.816	1.226

Table 5: Leadership Styles and Proactivity – Multicollinearity VIF

Only the eigenvalue of TL (Table 6) was close to 0 as the Group variable is nominal and not relevant. A regression between TL and the other independent variables produced an R^2 of .855 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	6.011
	2	.653
	3	.172
	4	.079
	5	.072
	6	.008
	7	.004

Table 6: Leadership Styles and Proactivity – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Leadership Styles and Proactivity.

Leadership Styles and Proactivity - Outlier Analysis.

The centered leverage value cut-off value in the following plot (Figure 18) was 0.46875 for the centered leverage value calculated as described in Chapter 3. Case 8 might be an outlier as in both criteria it is noticeable. The cases 7, 14, 15, 29, and 29 might be outliers due to Cook's D.

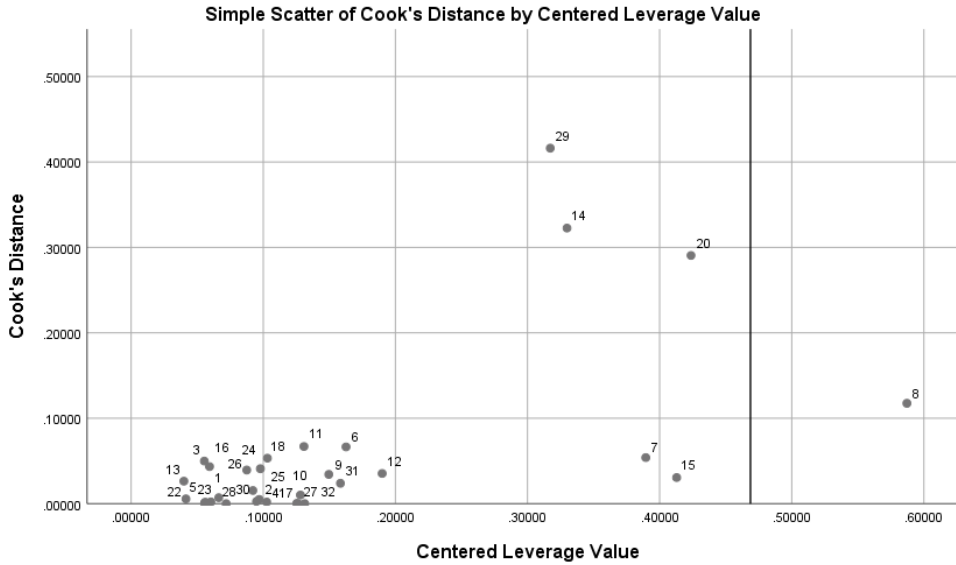


Figure 18: Leadership Styles and Proactivity, Outlier Cook's D / Centered Leverage

In the following plot (Figure 19) no outlier could be observed, all data points are outside the 3 threshold.

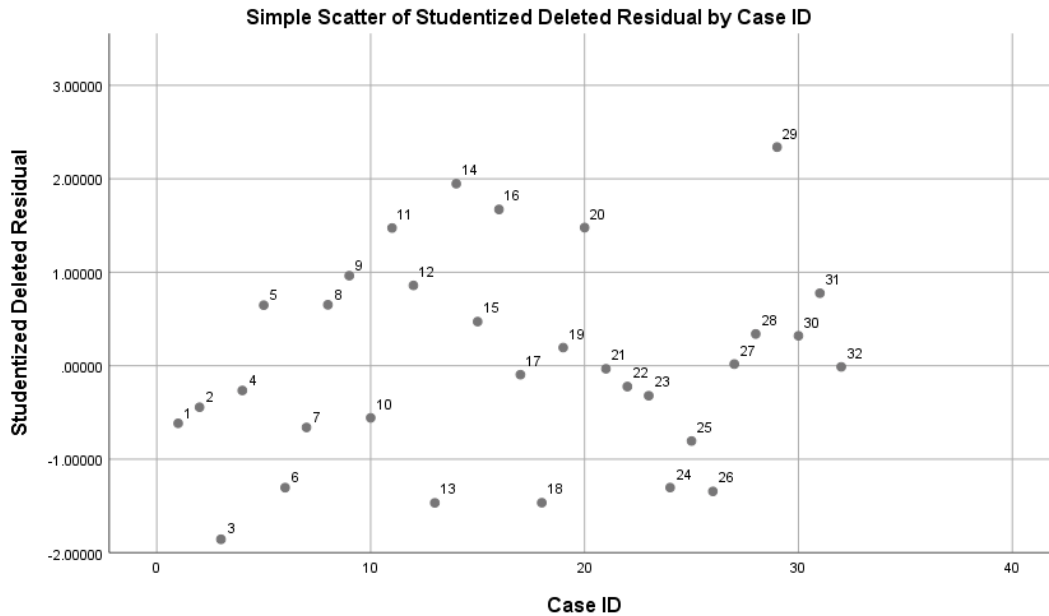


Figure 19: Leadership Styles and Proactivity, Outlier Externally Studentized residuals

No case was identified three times as a potential outlier.

Leadership Styles and Proactivity - Assumption Analysis.

Normality of Proactivity.

Both tests of normality (Table 7) were not significant, and the assumption was reasonably fulfilled (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Proactivity	.088	32	.200*	.972	32	.566

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 7: Leadership Style and Proactivity, Normality

Independence.

In all independence plots (figures 20 to 25), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with only one exception, which was always very close to the upper bound line. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

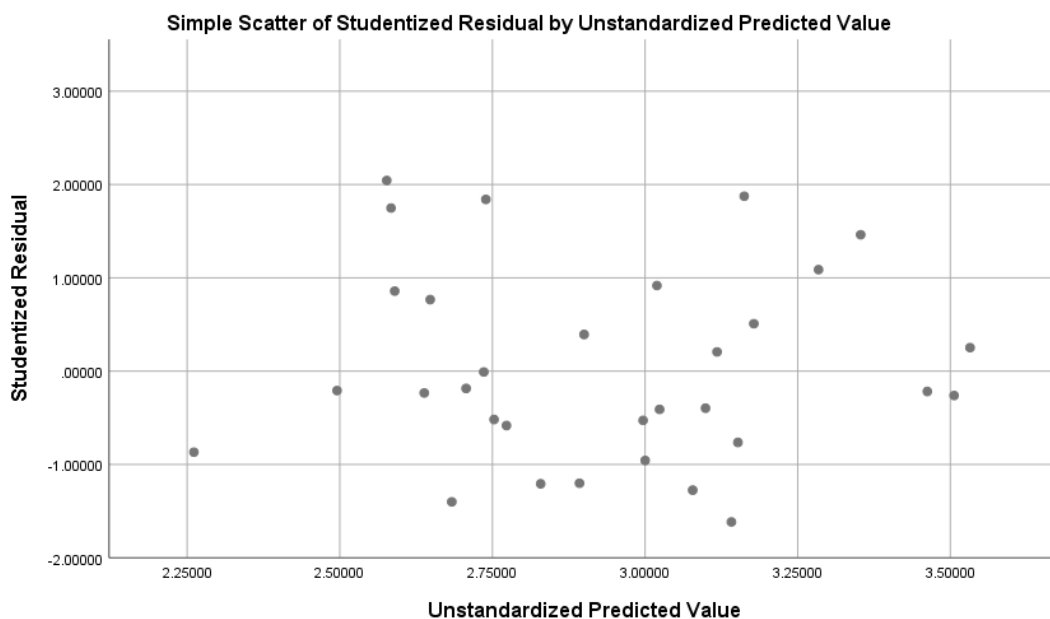


Figure 20: Leadership Styles and Proactivity – Independence Plot 1

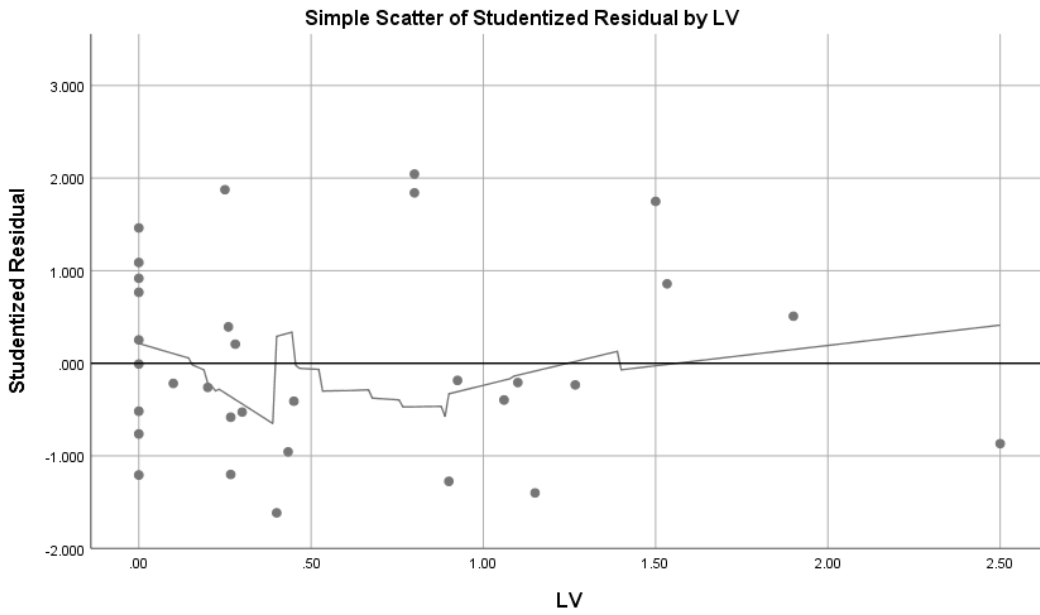


Figure 21: Leadership Styles and Proactivity – Independence Plot 2

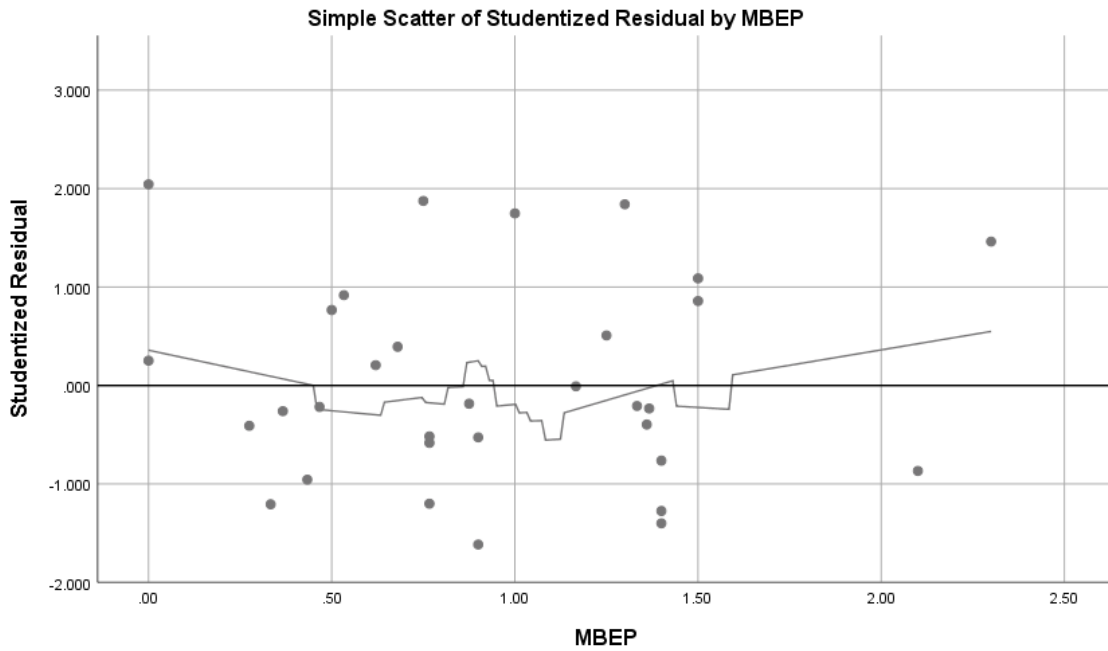


Figure 22: Leadership Styles and Proactivity – Independence Plot 3

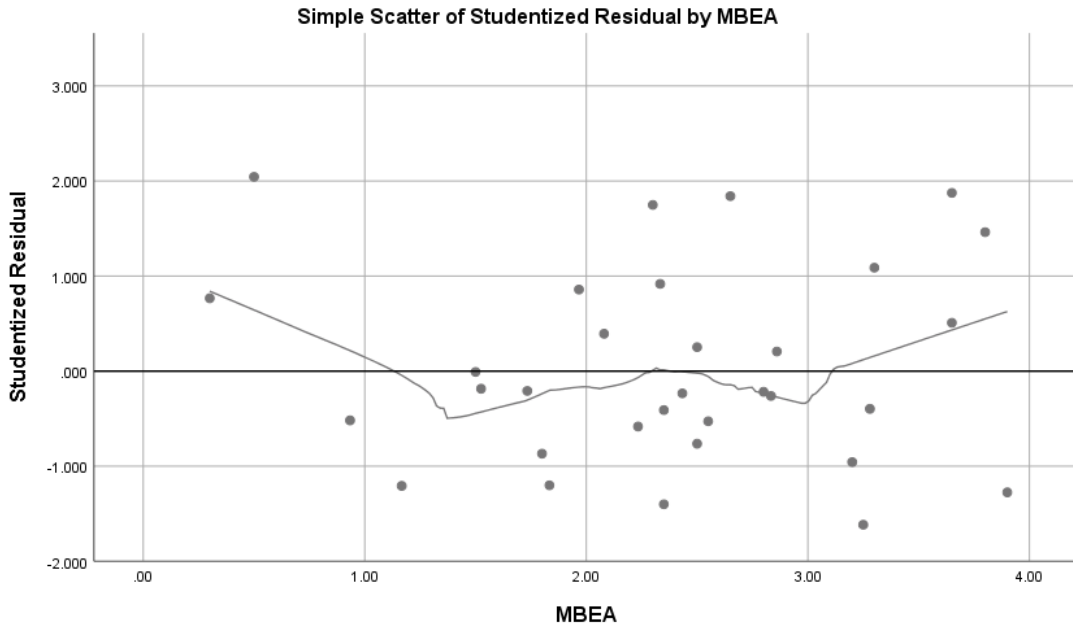


Figure 23: Leadership Styles and Proactivity – Independence Plot 4

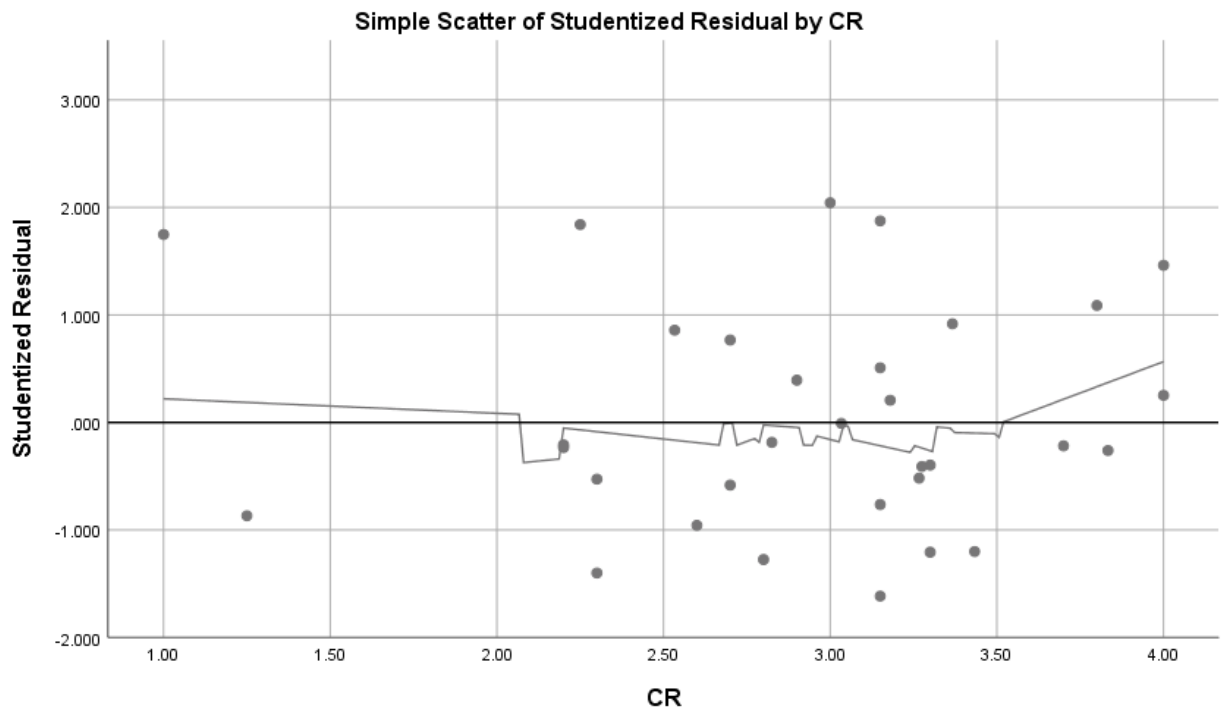


Figure 24: Leadership Styles and Proactivity – Independence Plot 5

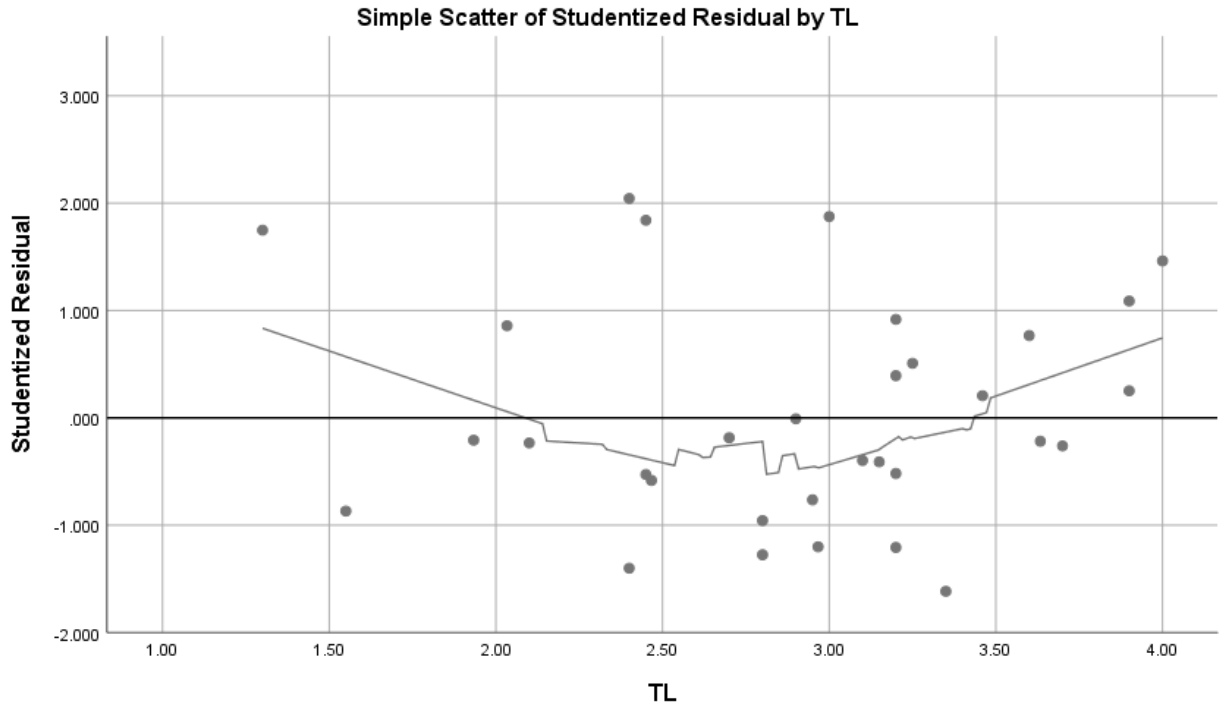


Figure 25: Leadership Styles and Proactivity – Independence Plot 6

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (figures 20 to 25) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (figure 26) were produced between all independent and dependent variables. Only linear or random patterns were observable. Verifying above independence plots 2 to 6, plots 4 and 6 showed a slight power pattern. As the x and y

values were restricted to 0 to 4, and the shown pattern was slight, it was acceptable (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

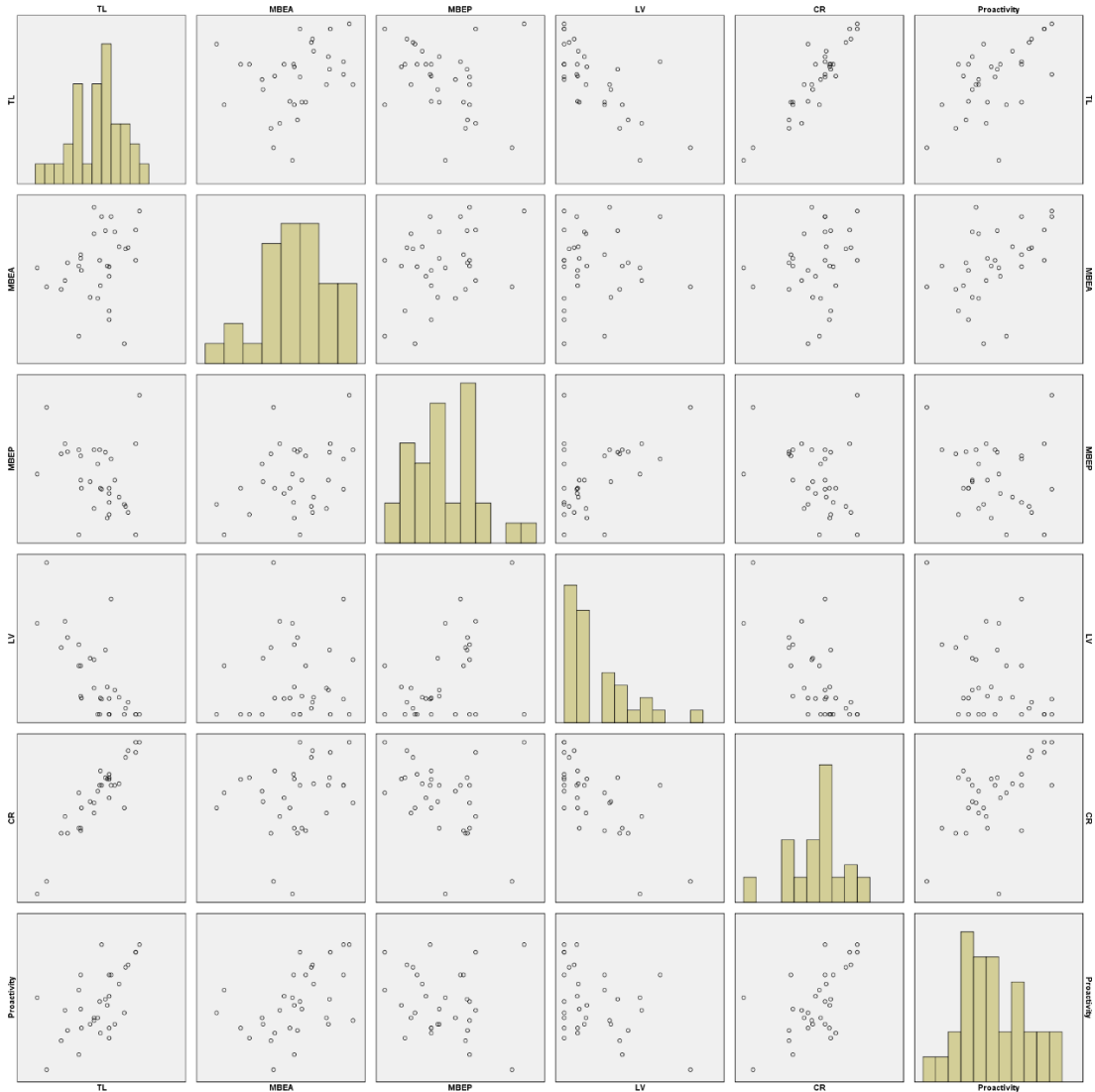


Figure 26: Leadership Styles and Proactivity – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values followed the line in the normal Q-Q plot of unstandardized residuals (Figure 27) in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

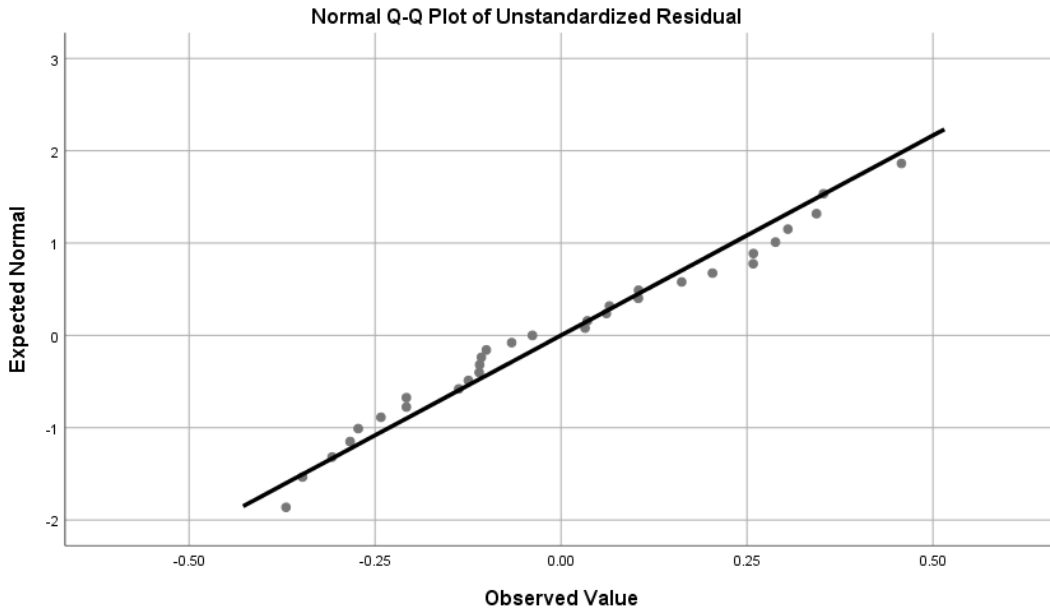


Figure 27: Leadership Styles and Proactivity – Normality Q-Q Plot

The skewness and kurtosis statistics (Table 8) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.051	
	95% Confidence Interval for Mean	Lower Bound	-.104	
		Upper Bound	.104	
	5% Trimmed Mean	-.004		
	Median	-.062		
	Variance	.083		
	Std. Deviation	.288		
	Minimum	-.491		
	Maximum	.561		

Range	1.052	
Interquartile Range	.415	
Skewness	.376	.414
Kurtosis	-.600	.809

Table 8: Leadership Styles and Proactivity – Normality Descriptive Statistics

The histogram (Figure 28) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

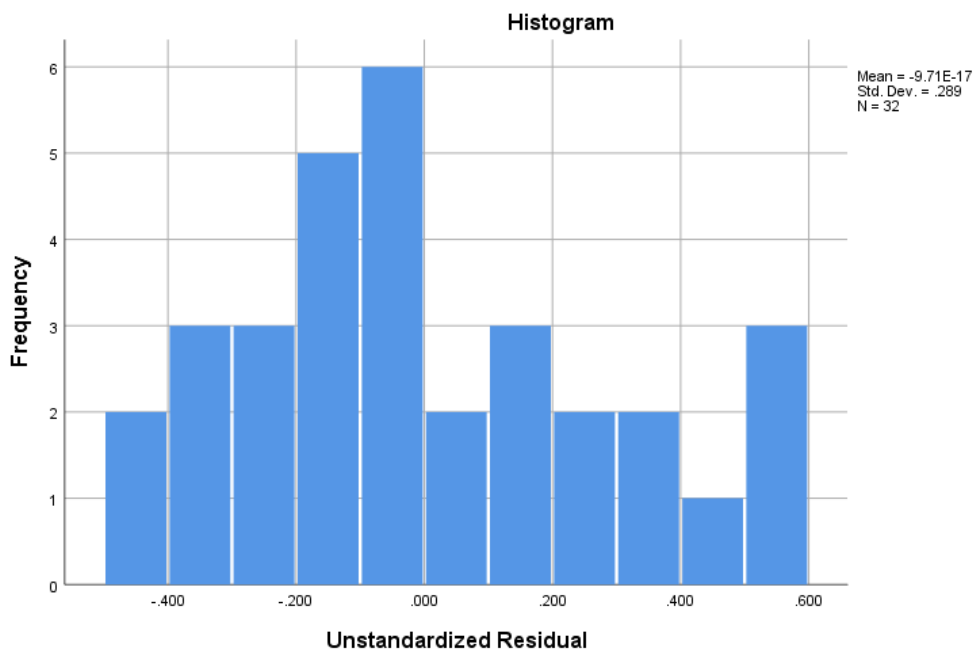


Figure 28: Leadership Styles and Proactivity – Normality Histogram

Examination of the boxplot (Figure 29) suggested no challenge to evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

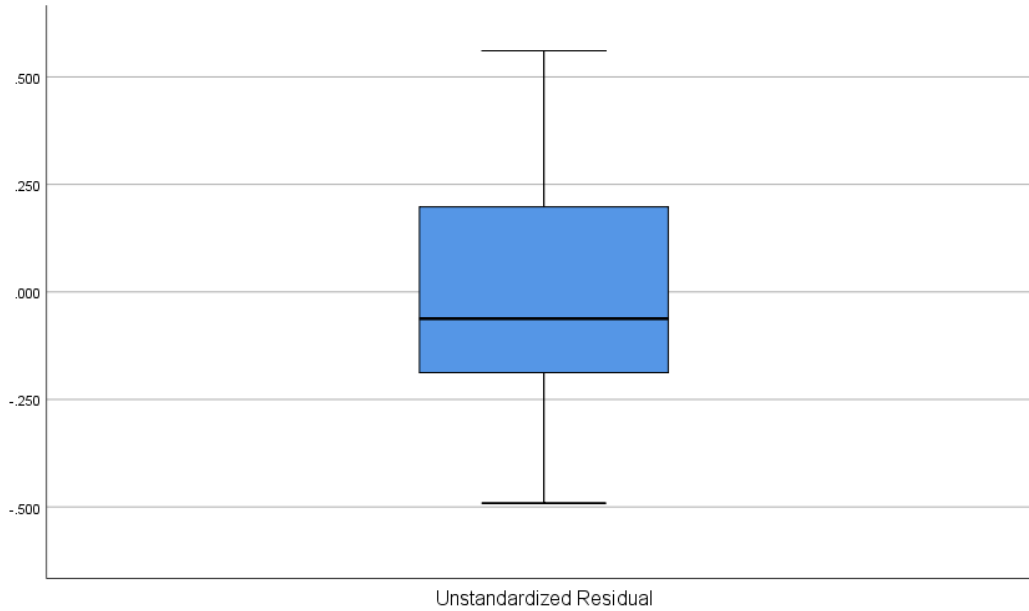


Figure 29: Leadership Styles and Proactivity – Normality Boxplot

Both tests of normality (Table 9) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.141	32	.109	.962	32	.304

a. Lilliefors Significance Correction

Table 9: Leadership Styles and Proactivity – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 10) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tolerance	VIF
1 (Constant)		

TL	.145	6.918
CR	.159	6.275
MBEA	.658	1.519
MBEP	.623	1.605
LV	.377	2.652
group	.867	1.154

Table 10: Leadership Styles and Proactivity – Multicollinearity VIF

Only the eigenvalue (Table 11) of Laissez Fair was close to 0 as the Group variable was nominal and not relevant. A regression between Laissez Fair and the other independent variables produced an R^2 of .623 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	6.014
	2	.648
	3	.171
	4	.078
	5	.075
	6	.009
	7	.004

Table 11: Leadership Styles and Proactivity – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Leadership Styles and Innovative Work Behavior.

Leadership Styles and Innovative Work Behavior - Outlier Analysis.

The centered leverage value (Figure 30) cut-off value was 0.46875 calculated as described in Chapter 3. Case 8 might be an outlier. Even though case 11 was not critical

of the centered leverage value, an outlier possibility is strongly supported by Cook's D (Figure 30).

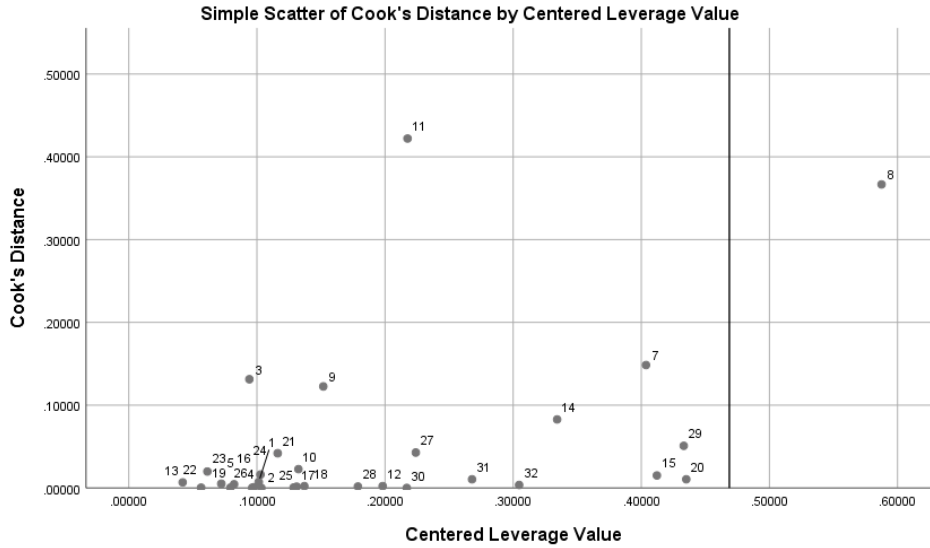


Figure 30: Leadership Styles and IWB, Outlier Cook's D / Centered Leverage

Cases 11 (Figure 31) might be an outlier as it is located outside the threshold of 3 and close to 4.

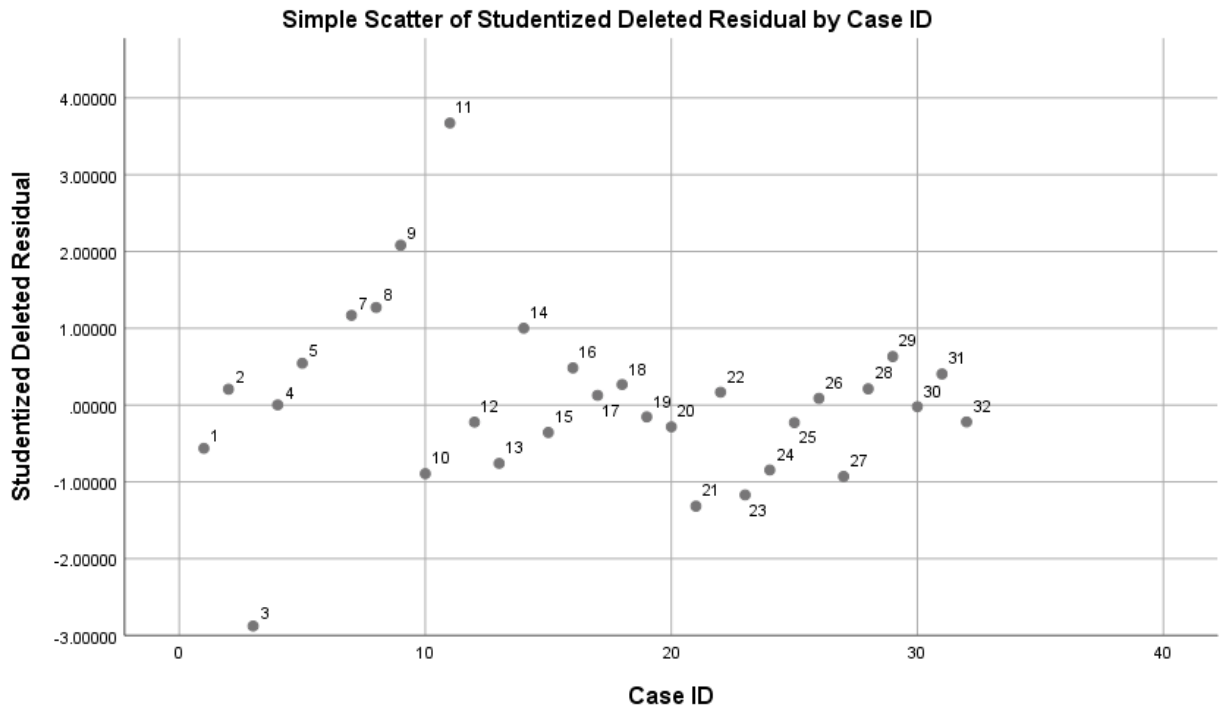


Figure 31: Leadership Styles and IWB, Outlier Externally Studentized residuals

Cases 8 and 11 were excluded because in both cases two outlier verifications were rather strong.

Leadership Styles and Innovative Work Behavior - Assumption Analysis.

Normality of Innovative Work Behavior.

No test of normality (Table 12) was significant. But one test was close to significance, and further analysis was conducted.

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Innovative Workbehavior	.122	30	.200*	.932	30	.056

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 12: Leadership Styles and IWB, Normality of IWB - Tests

The observed values in the normal Q-Q plot (Figure 31) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

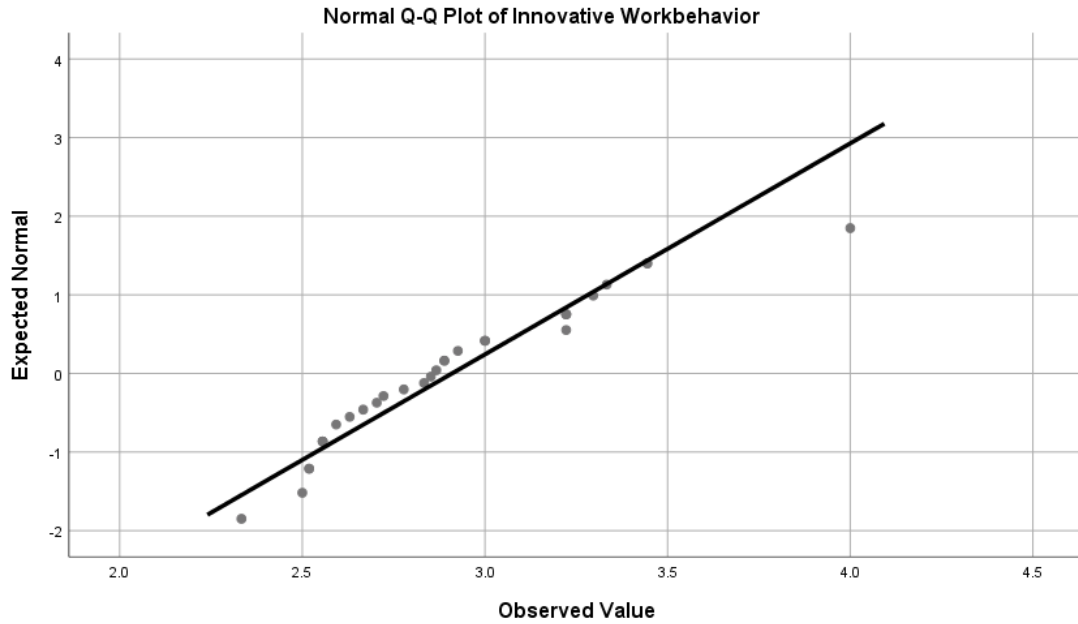


Figure 32: Leadership Styles and IWB, Normality of IWB – Normality Q-Q Plot

The skewness and kurtosis statistics (Table 13) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

			Statistic	Std. Error
Innovative Workbehavior	Mean		2.909	.068
	95% Confidence Interval for Mean	Lower Bound	2.770	
		Upper Bound	3.048	
	5% Trimmed Mean		2.888	
	Median		2.859	
	Variance		.139	
	Std. Deviation		.372	
	Minimum		2.333	
	Maximum		4.000	
	Range		1.666	
	Interquartile Range		.638	
	Skewness		.900	.427
	Kurtosis		.903	.833

Table 13: Leadership Styles and IWB, Normality of IWB - Descriptive

The histogram (Figure 33) reflected a still acceptable normal distribution suggesting evidence of normality, but the one data point to the right as the positive skewness are challenging (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

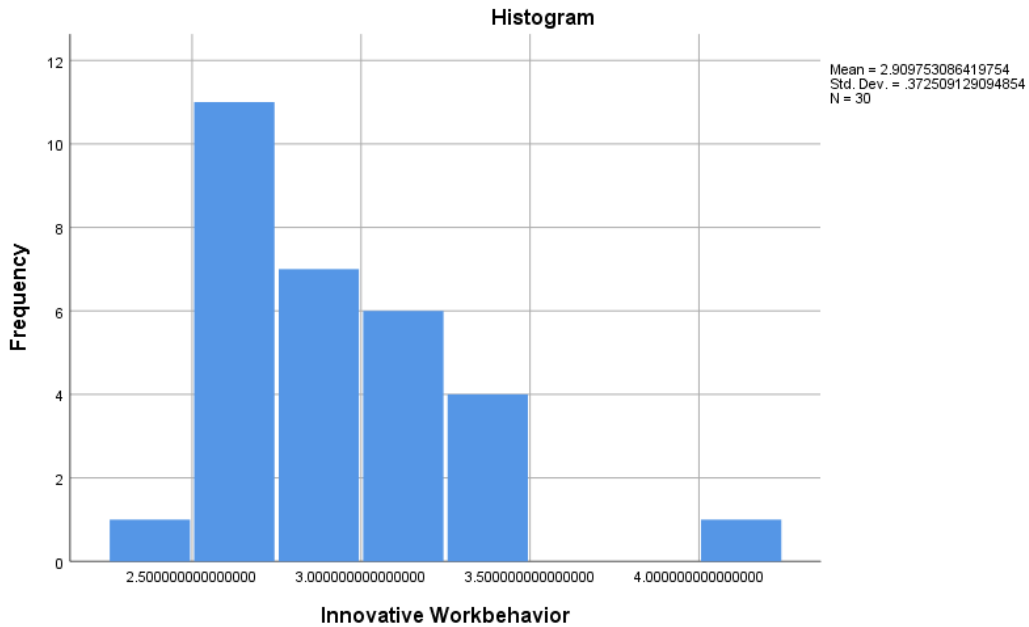


Figure 33: Leadership Styles and IWB, Normality of IWB – Normality Histogram

Examination of the above boxplot (Figure 34) suggested evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

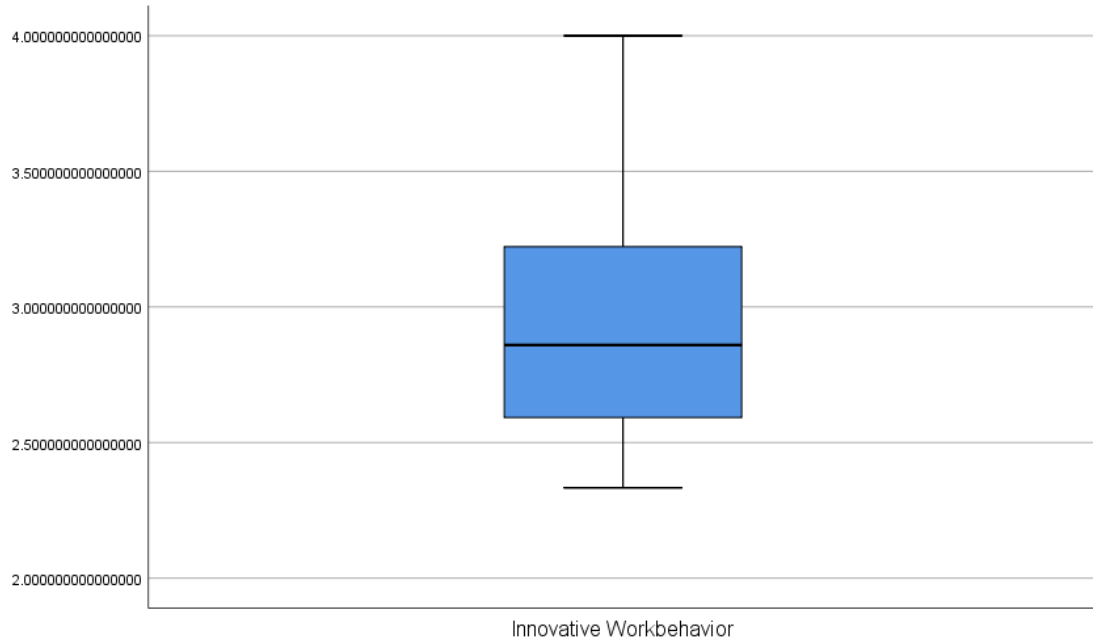


Figure 34: Leadership Styles and IWB, Normality of IWB – Normality Boxplot

Considering all evidence from above, the normality assumption was reasonably fulfilled (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 35 to 40), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with only one data point exception. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

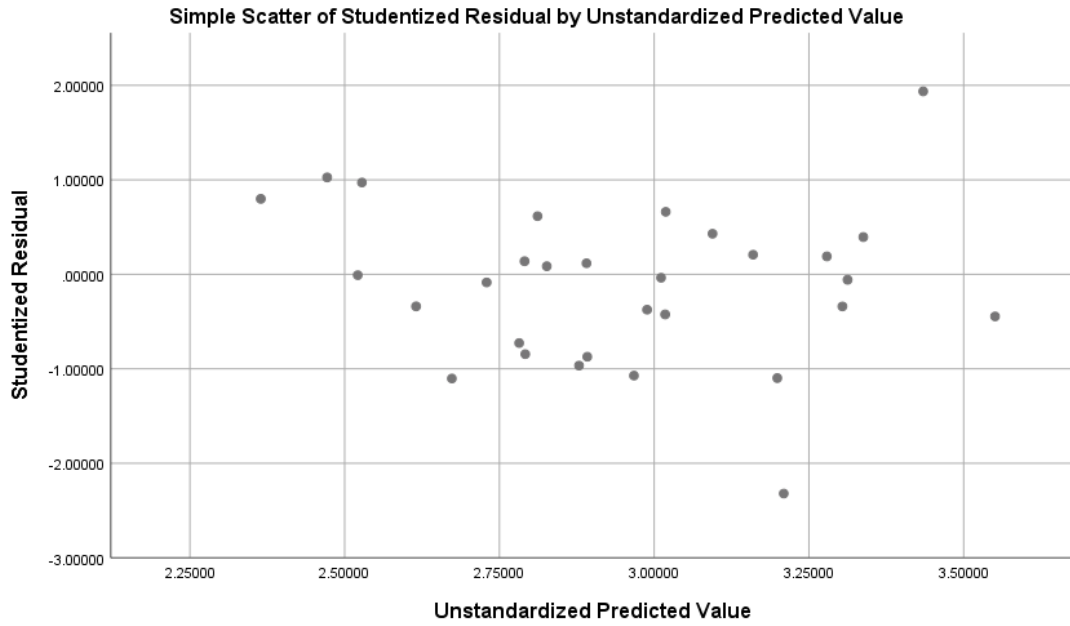


Figure 35: Leadership Styles and IWB – Independence Plot 1

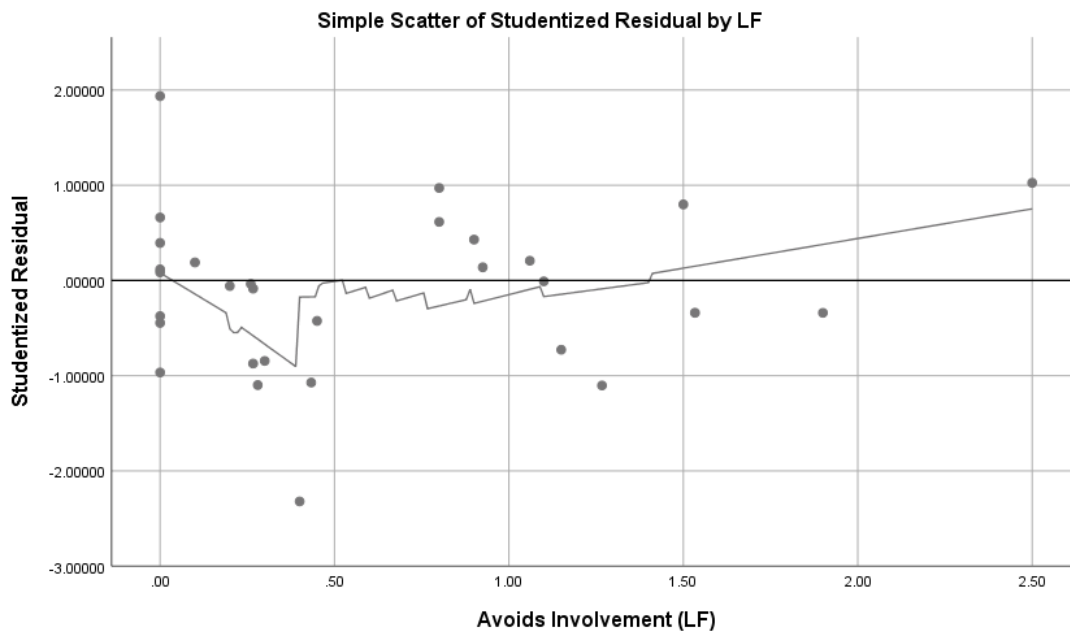


Figure 36: Leadership Styles and IWB – Independence Plot 2

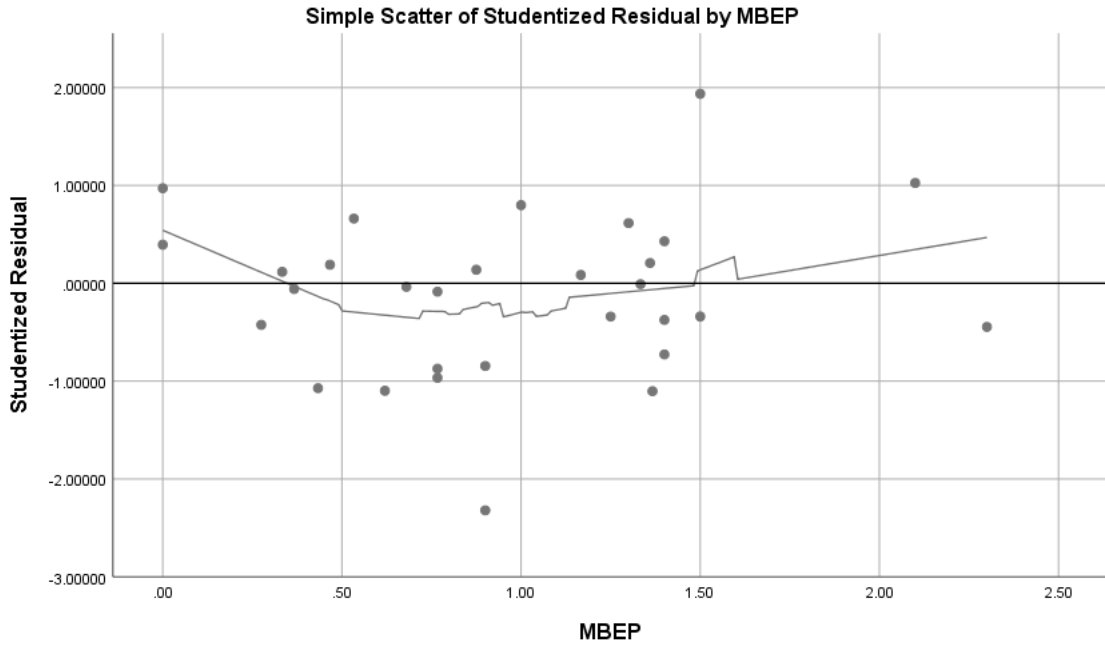


Figure 37: Leadership Styles and IWB – Independence Plot 3

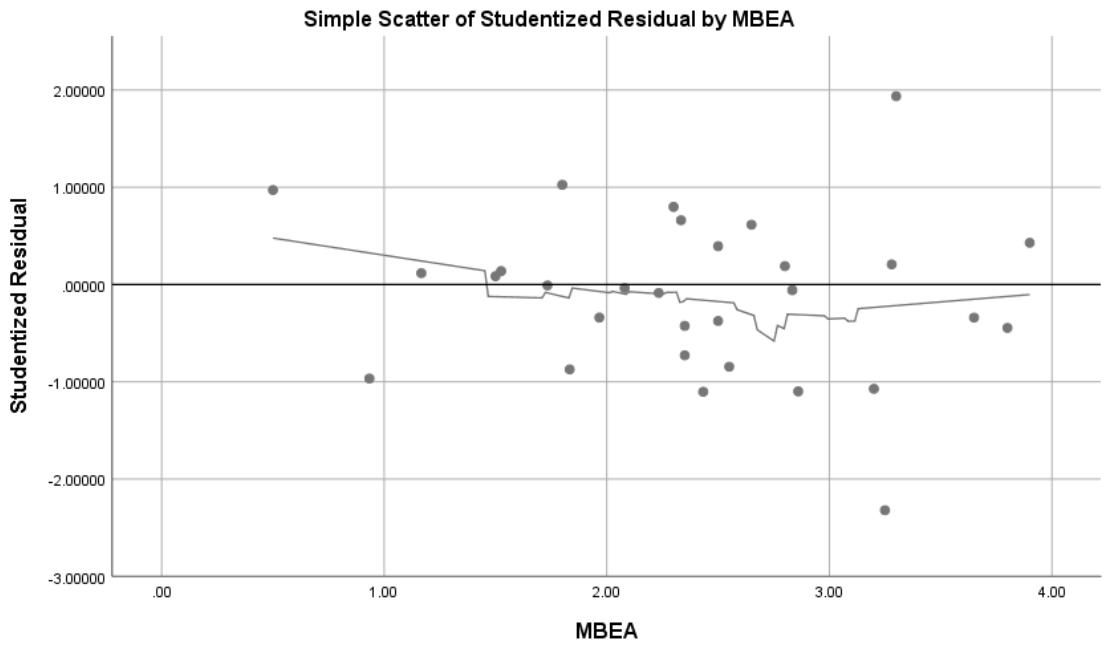


Figure 38: Leadership Styles and IWB – Independence Plot 4

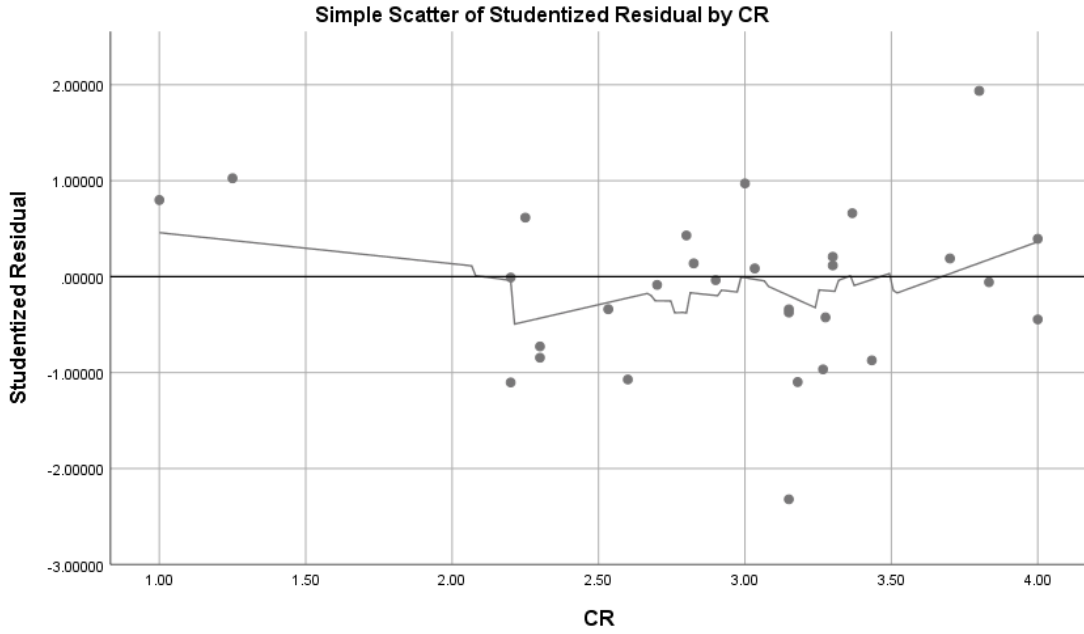


Figure 39: Leadership Styles and IWB – Independence Plot 5

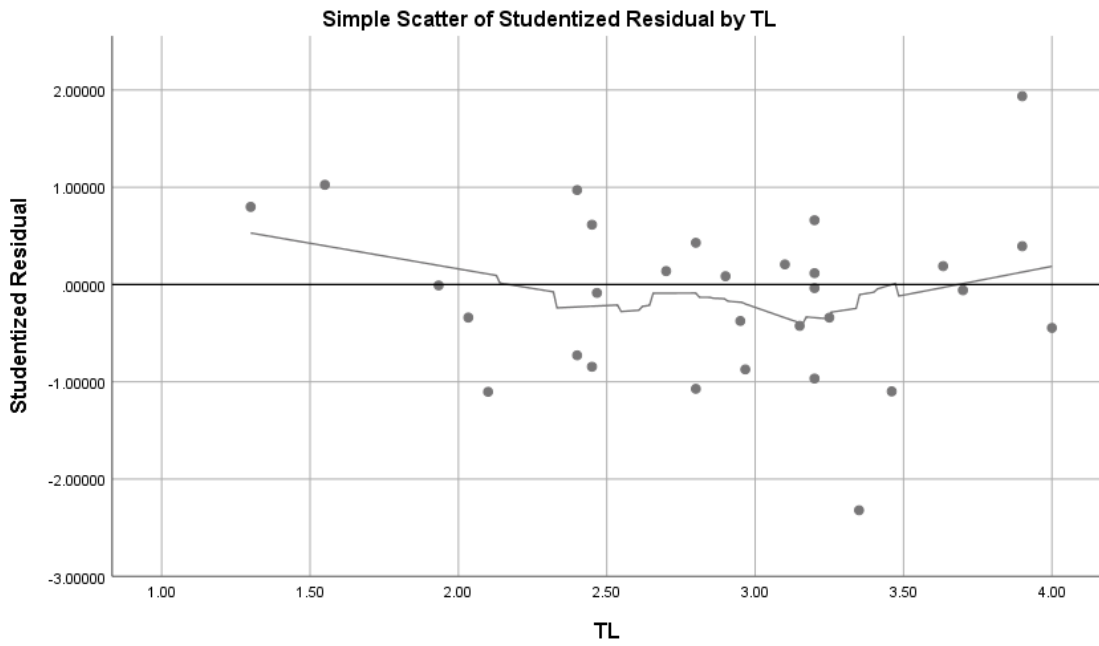


Figure 40: Leadership Styles and IWB – Independence Plot 6

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 35 to 40) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 41) were produced between all independent and dependent variables. Only linear or random patterns were observable. Verifying above independence plots 2 to 6 linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

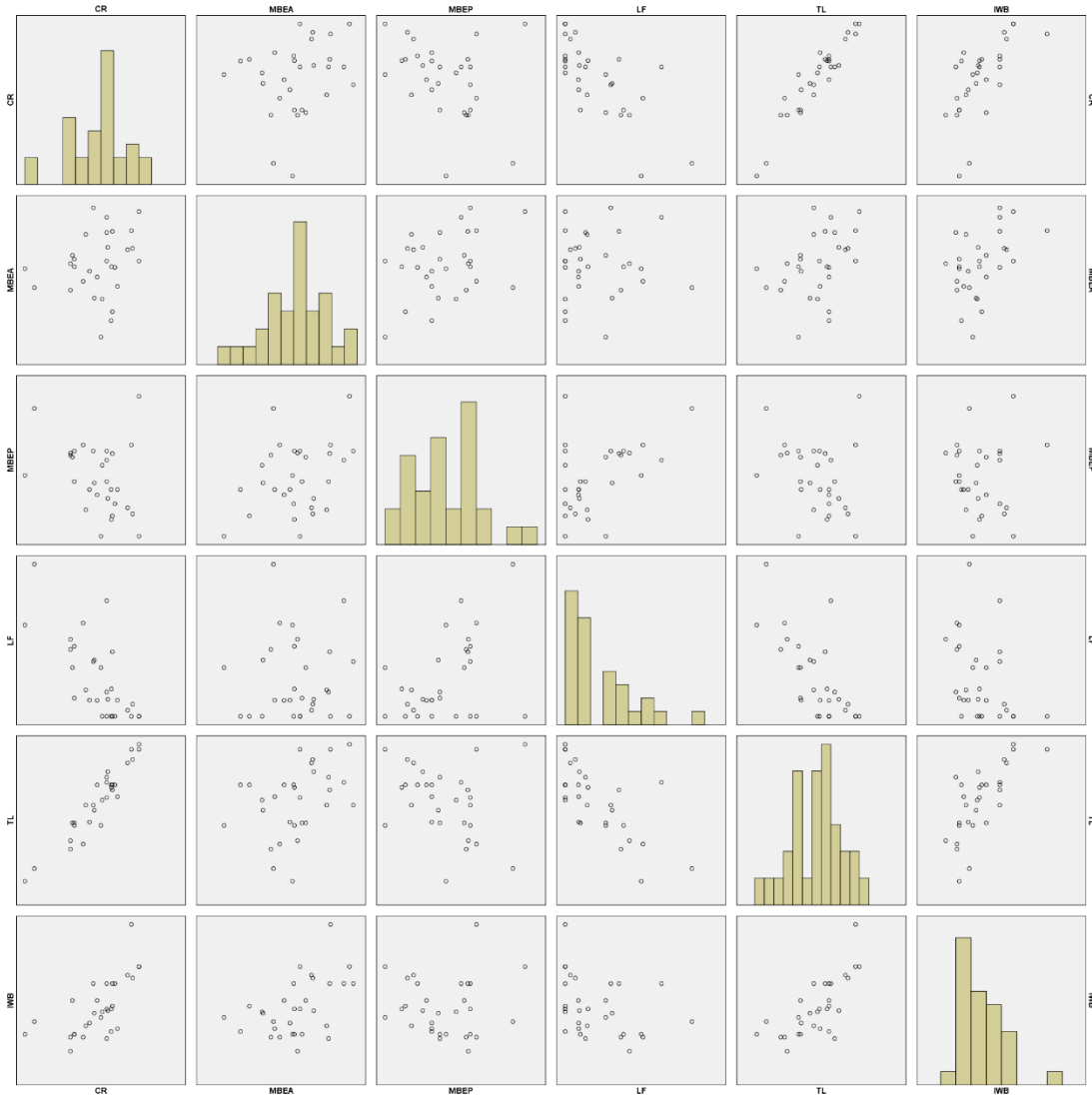


Figure 41: Leadership Styles and IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q plot (Figure 42) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

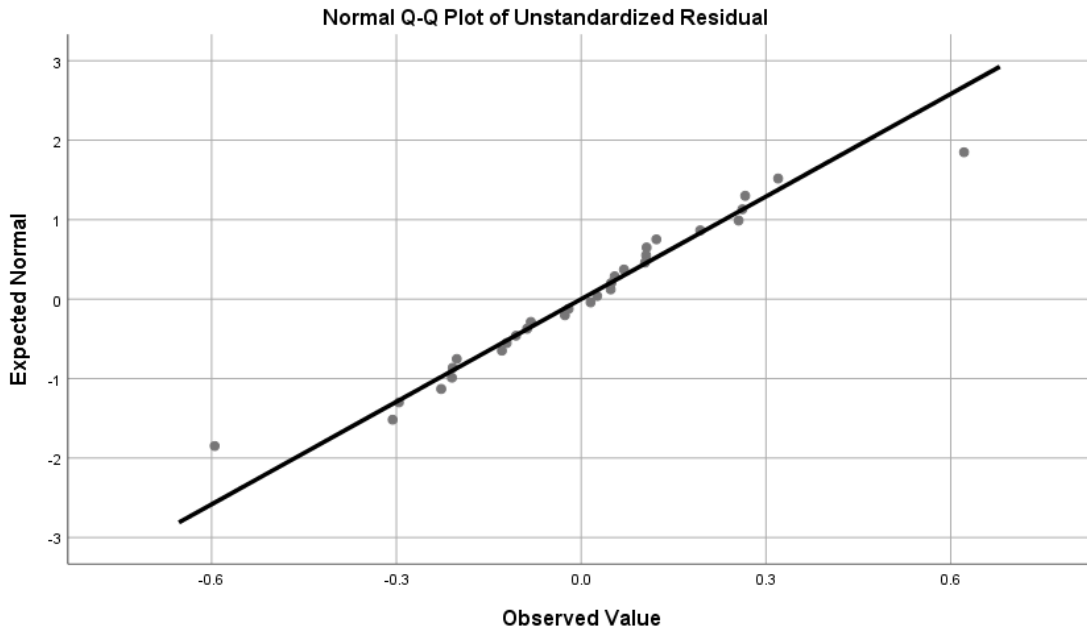


Figure 42: Leadership Styles and IWB – Normality Q-Q Plot

The skewness and kurtosis (Table 14) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.0423	
	95% Confidence Interval for Mean	Lower Bound	-.086	
		Upper Bound	.086	
	5% Trimmed Mean	-.001		
	Median	.015		
	Variance	.054		
	Std. Deviation	.231		
	Minimum	-.584		
	Maximum	.627		
	Range	1.211		
	Interquartile Range	.274		
	Skewness	.139	.427	
	Kurtosis	1.377	.833	

Table 14: Leadership Styles and IWB – Normality Descriptive Statistics

The histogram (Figure 43) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

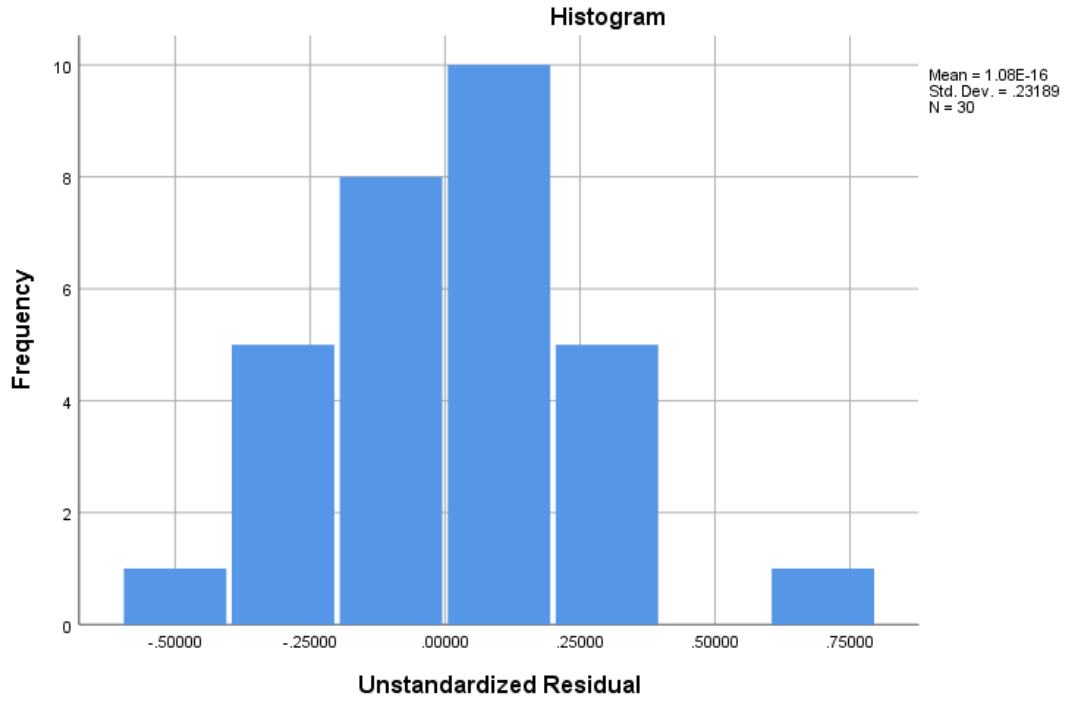


Figure 43: Leadership Styles and IWB – Normality Histogram

Examination of the below boxplot (Figure 44) challenged the evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013)

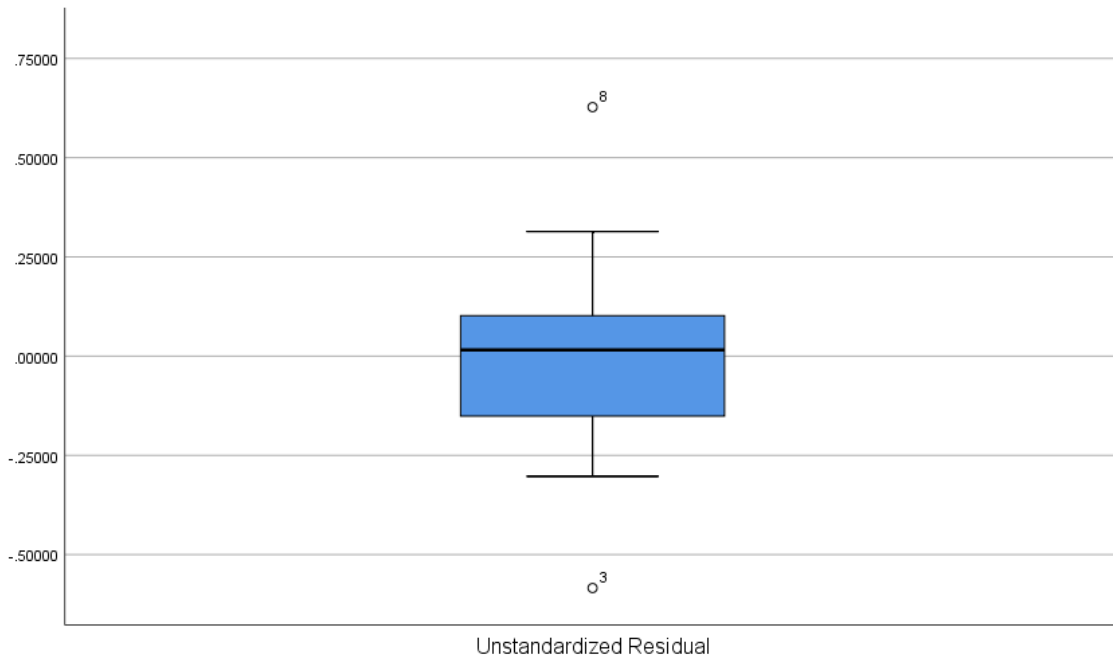


Figure 44: Leadership Styles and IWB – Normality Boxplot

Both tests of normality (Table 15) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.097	30	.200*	.977	30	.731

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 15: Leadership Styles and IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled but challenged.

Multicollinearity.

The VIF (Table 16) was above 10 suggesting multicollinearity is present between CR and TL. (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). To overcome the multicollinearity one variable needed to be dropped (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013). As the literature indicates that TL is a stronger influence factor on positive employee behavior than CR, CR will be dropped in the next model.

Model		Tolerance	VIF
1	(Constant)		
	CR	.086	11.653
	MBEA	.458	2.183
	MBEP	.607	1.648
	LF	.371	2.696
	TL	.068	14.811
	group	.836	1.197

Table 16: Leadership Styles and IWB – Multicollinearity VIF

Leadership Styles (no CR) and Innovative Work Behavior - Assumption Analysis.

Normality of Innovative Work Behavior.

Both tests of normality (Table 17) were not significant, and the assumption is reasonably fulfilled (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Proactivity	.088	32	.200*	.972	32	.566

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 17: Leadership Styles/CR and IWB – Normality IWB

Independence.

In all plots of independence (Figures 45 to 49), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with two exceptions. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

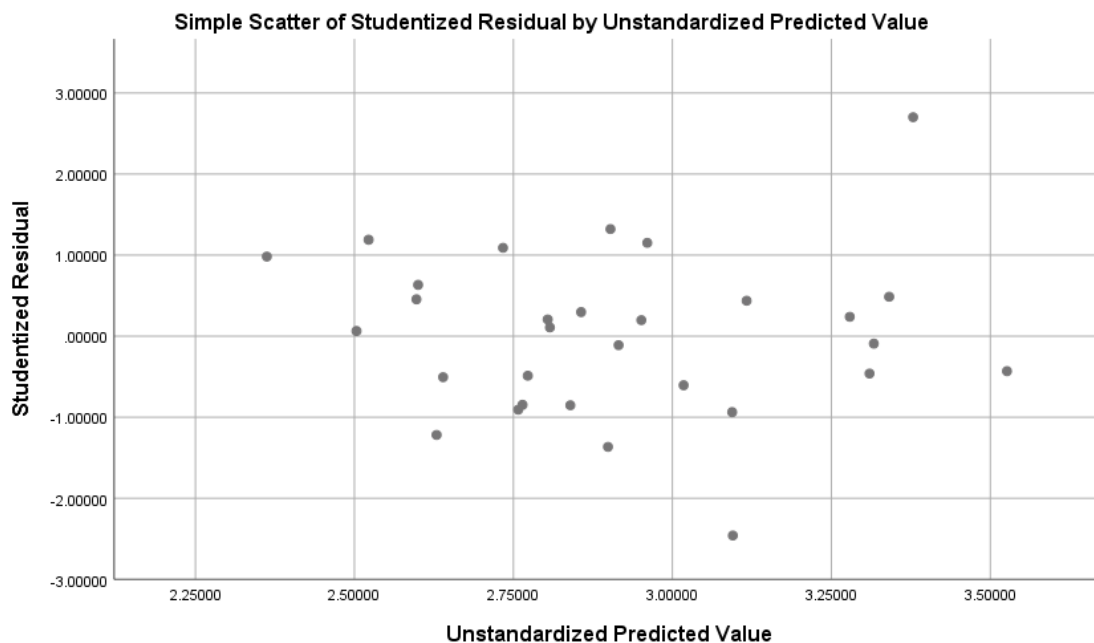


Figure 45: Leadership Styles/CR and IWB – Independence Plot 1

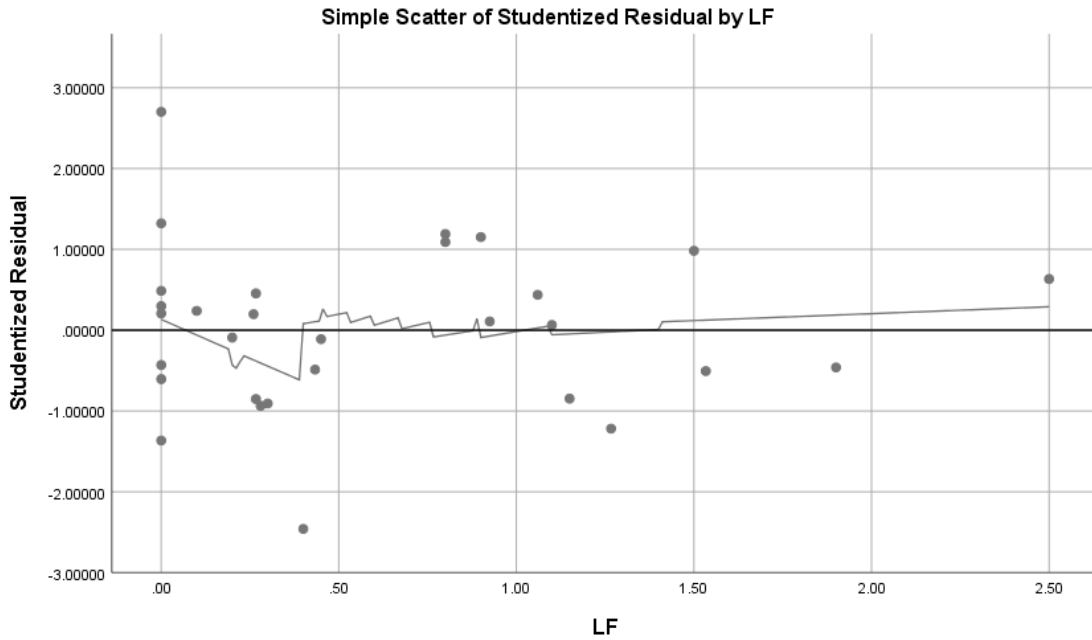


Figure 46: Leadership Styles/CR and IWB – Independence Plot 2

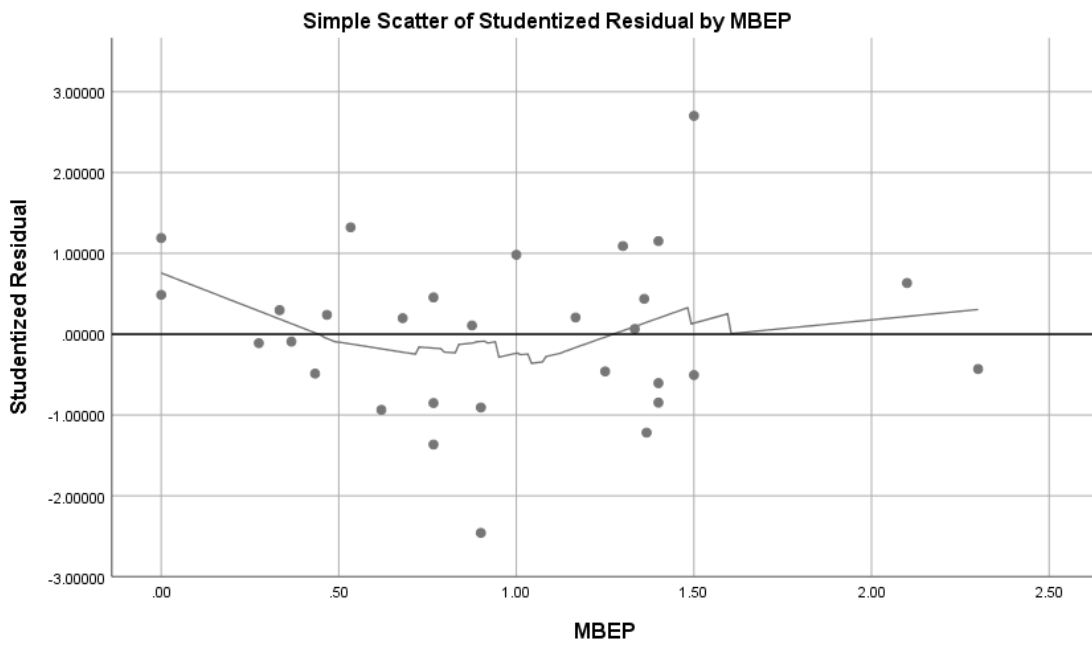


Figure 47: Leadership Styles/CR and IWB – Independence Plot 3

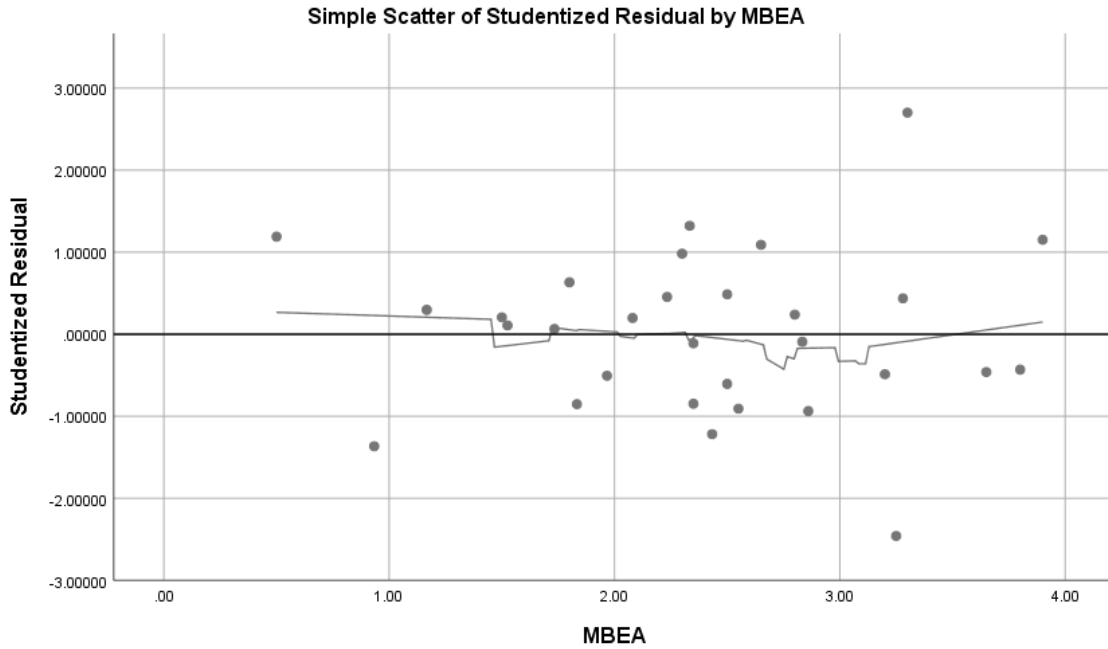


Figure 48: Leadership Styles/CR and IWB – Independence Plot 4

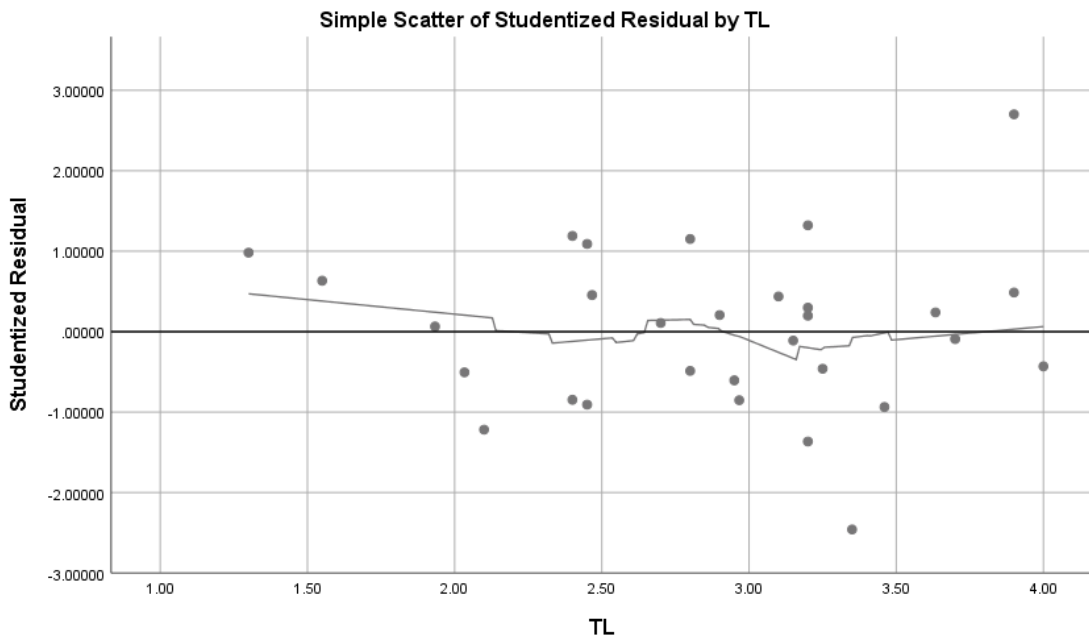


Figure 49: Leadership Styles/CR and IWB – Independence Plot 5

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 45 to 49) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 50) were produced between all independent and dependent variables. Only linear or random patterns were observable. Verifying above independence plots 2 to 5, the linearity assumption was acceptably fulfilled (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

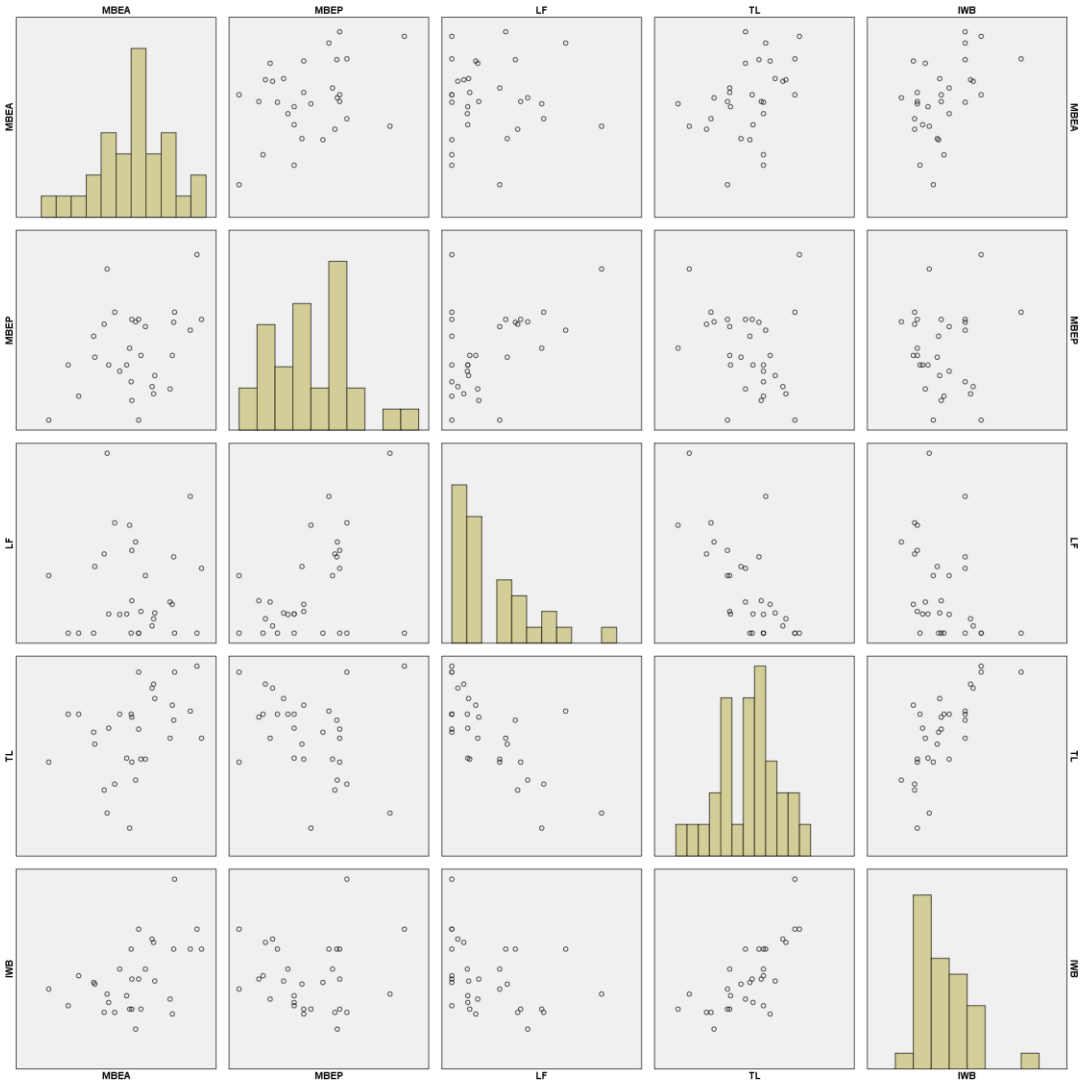


Figure 50: Leadership Styles/CR and IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q plot (Figure 51) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

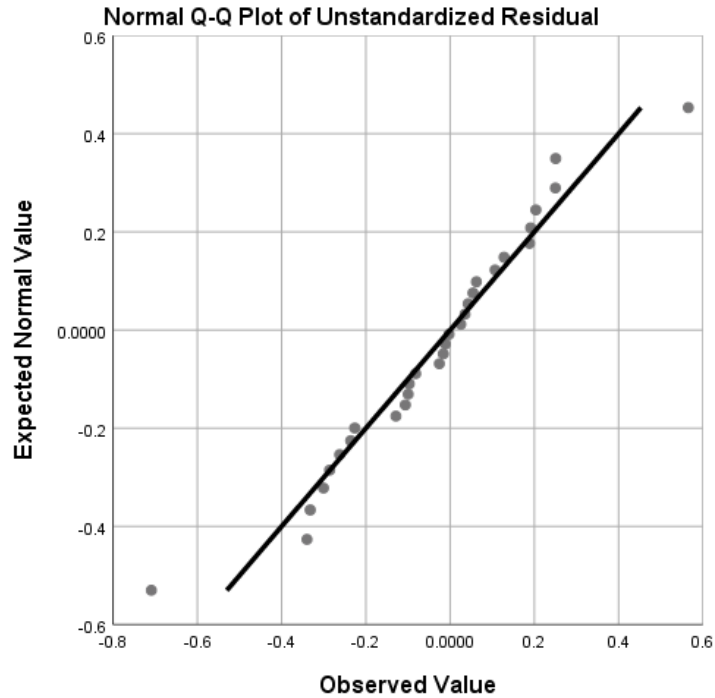


Figure 51: Leadership Styles/CR and IWB – Normality Q-Q Plot

The skewness and kurtosis statistics (Table 18) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.042	
	95% Confidence Interval for Mean	Lower Bound	-.086	
		Upper Bound	.086	
	5% Trimmed Mean	-.001		
	Median	.020		
	Variance	.054		
	Std. Deviation	.232		
	Minimum	-.595		
	Maximum	.621		
	Range	1.216		
	Interquartile Range	.257		
	Skewness	.087	.427	
	Kurtosis	1.414	.833	

Table 18: Leadership Styles/CR and IWB – Normality Descriptive Statistics

The histogram (Figure 52) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

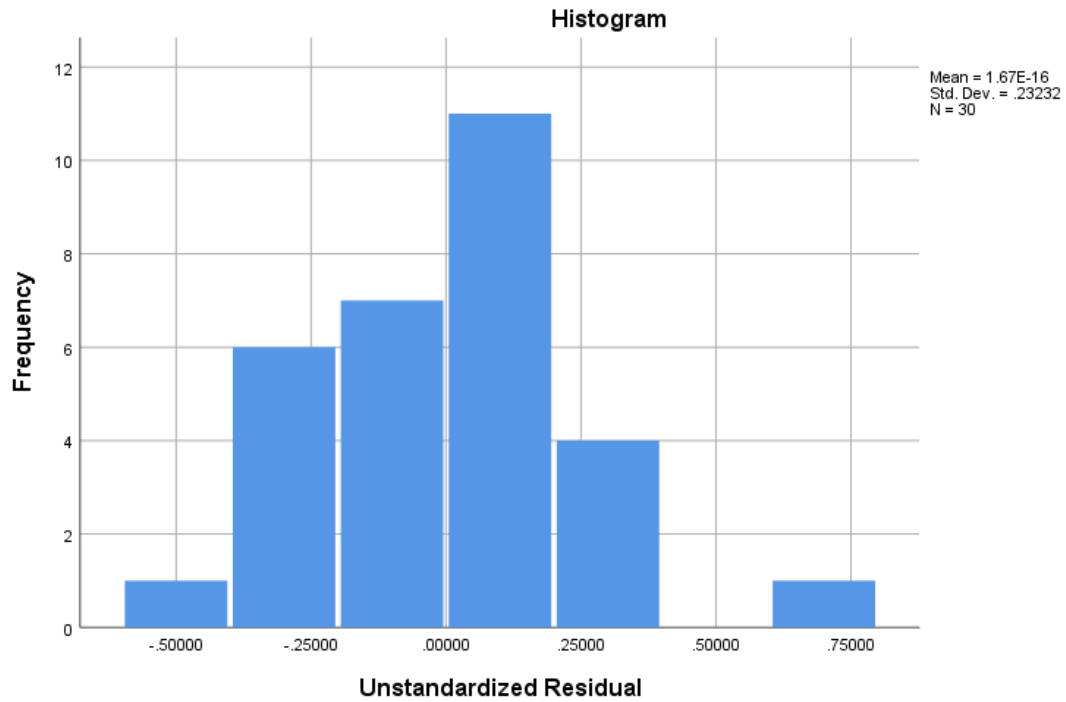


Figure 52: Leadership Styles/CR and IWB – Normality Histogram

Examination of the boxplot (Figure 53) suggested a challenge to evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

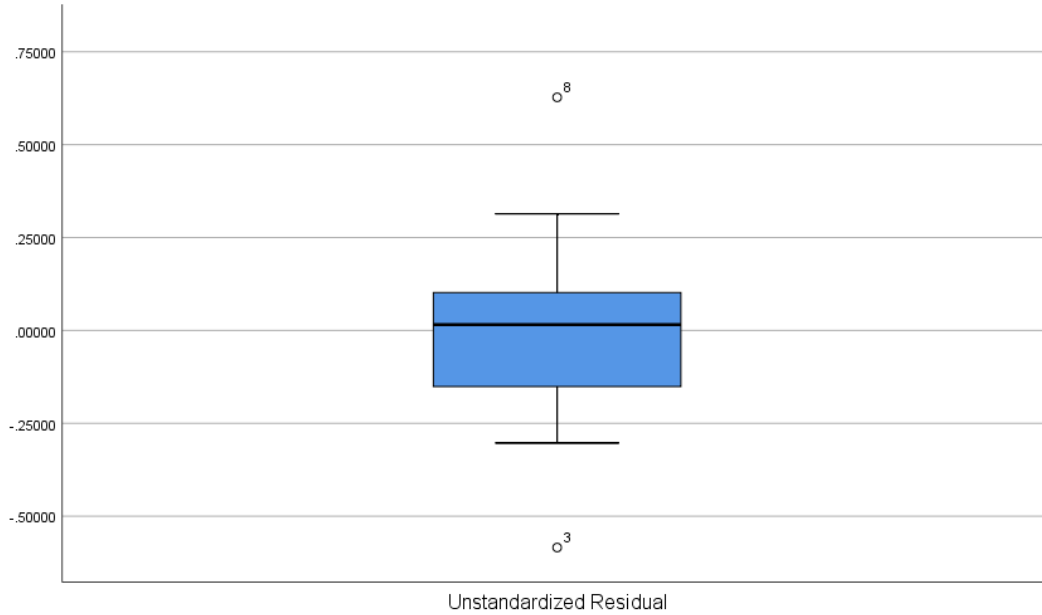


Figure 53: Leadership Styles/CR and IWB – Normality Boxplot

Both tests of normality (Table 19) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.100	30	.200*	.975	30	.688

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 19: Leadership Styles/CR and IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 20) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model

		Tolerance	VIF
1	(Constant)		
	MBEA	.533	1.877
	MBEP	.607	1.648
	LF	.371	2.695
	group	.837	1.194
	TL	.320	3.122

Table 20: Leadership Styles/CR and IWB – Multicollinearity VIF

Only the eigenvalue of TL (Table 21) was close to 0. A regression between TL and the other independent variables produced an R^2 of .68 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	5.127
	2	.572
	3	.174
	4	.070
	5	.051
	6	.007

Table 21: Leadership Styles/CR and IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Mediation Model – TL through Respect to Proactivity.

TL through Respect to Proactivity - Outlier Analysis.

The centered leverage value (Figure 54) cut-off value was 0.28125 calculated as described in Chapter 3. Case 29 might be an outlier as in both criteria it is noticeable.

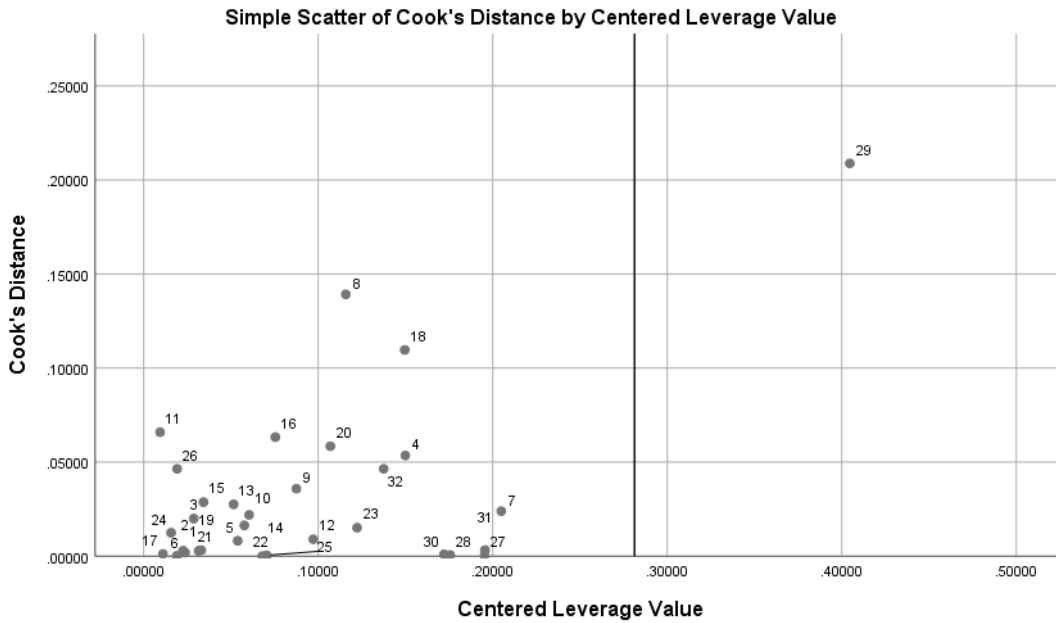


Figure 54: TL through Respect to Proactivity, Outlier Cook's D / Centered Leverage

Cases 11 might be an outlier (Figure 55).

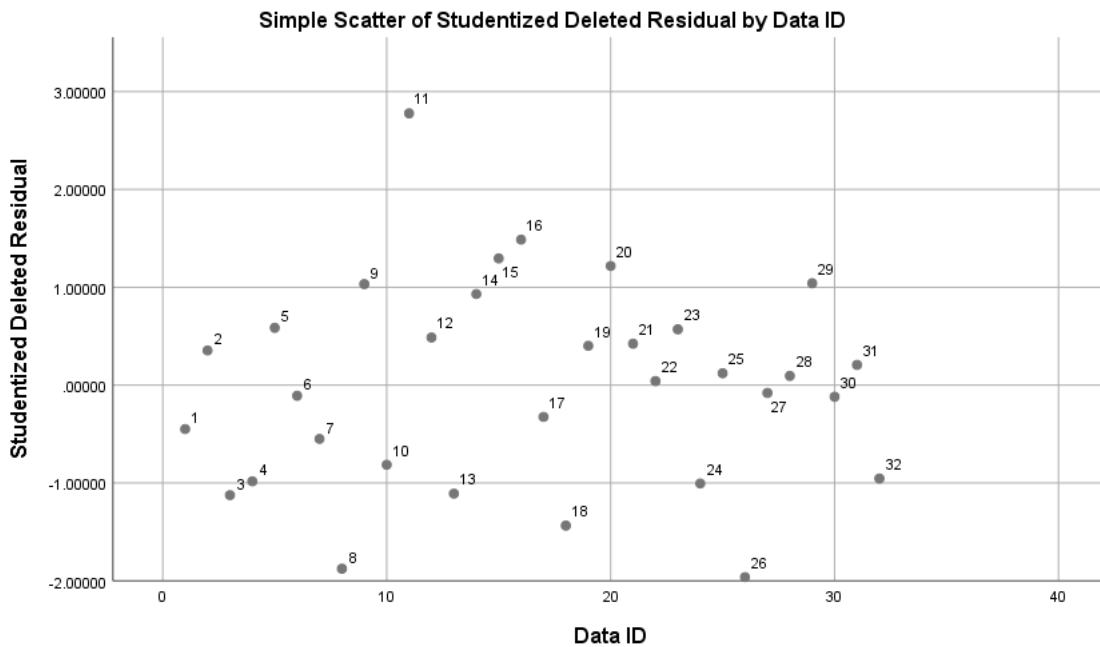


Figure 55: TL through Respect to Proactivity, Outlier Externally Studentized residuals

No case was identified three times as a potential outlier.

TL through Respect to Proactivity - Assumption Analysis.

Normality of Proactivity.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 56 to 58), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with only one exception. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

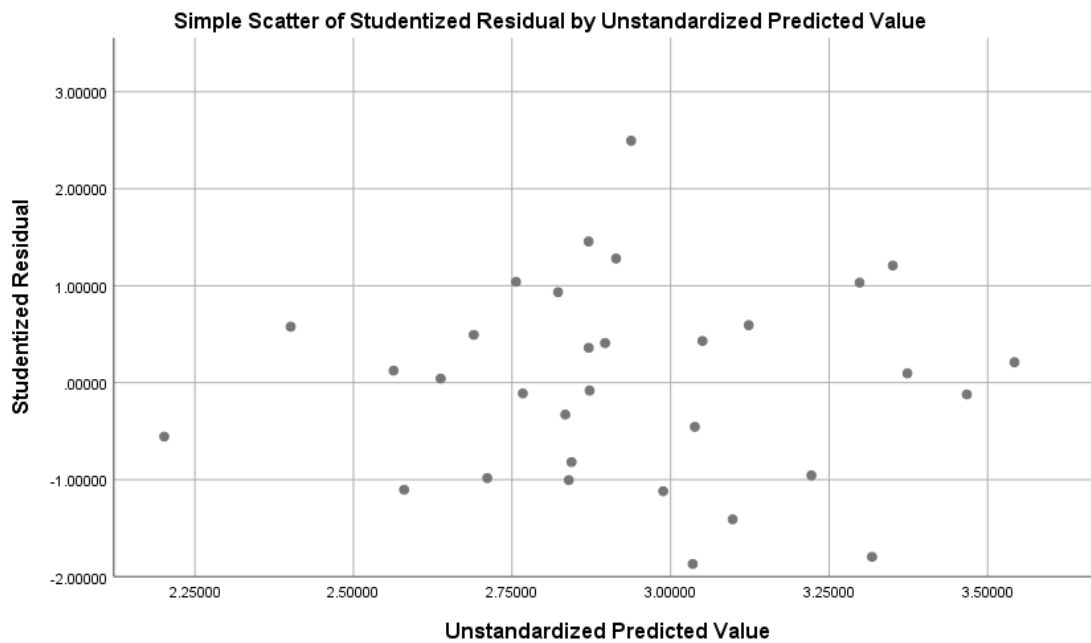


Figure 56: TL through Respect to Proactivity – Independence Plot 1



Figure 57: TL through Respect to Proactivity – Independence Plot 2

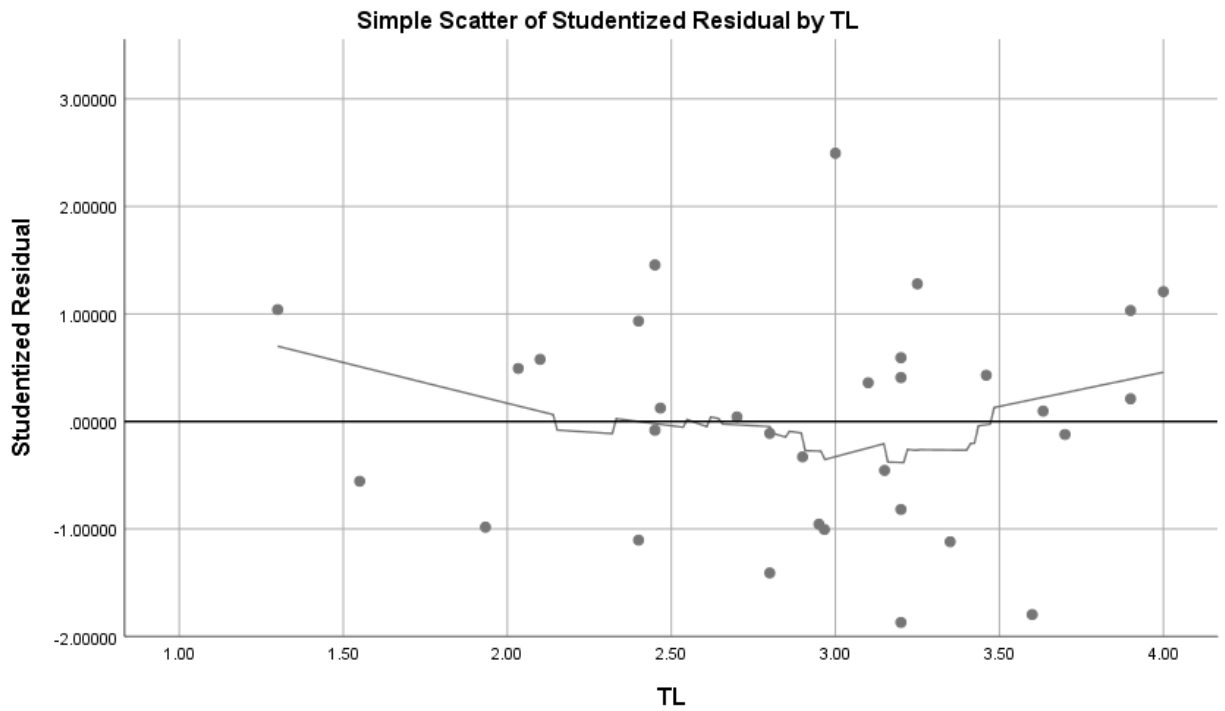


Figure 58: TL through Respect to Proactivity – Independence Plot 3

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 56 to 58) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 59) were produced between all independent and dependent variables. Only linear or random patterns were observable. Verifying above independence plots 2 and 3 linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

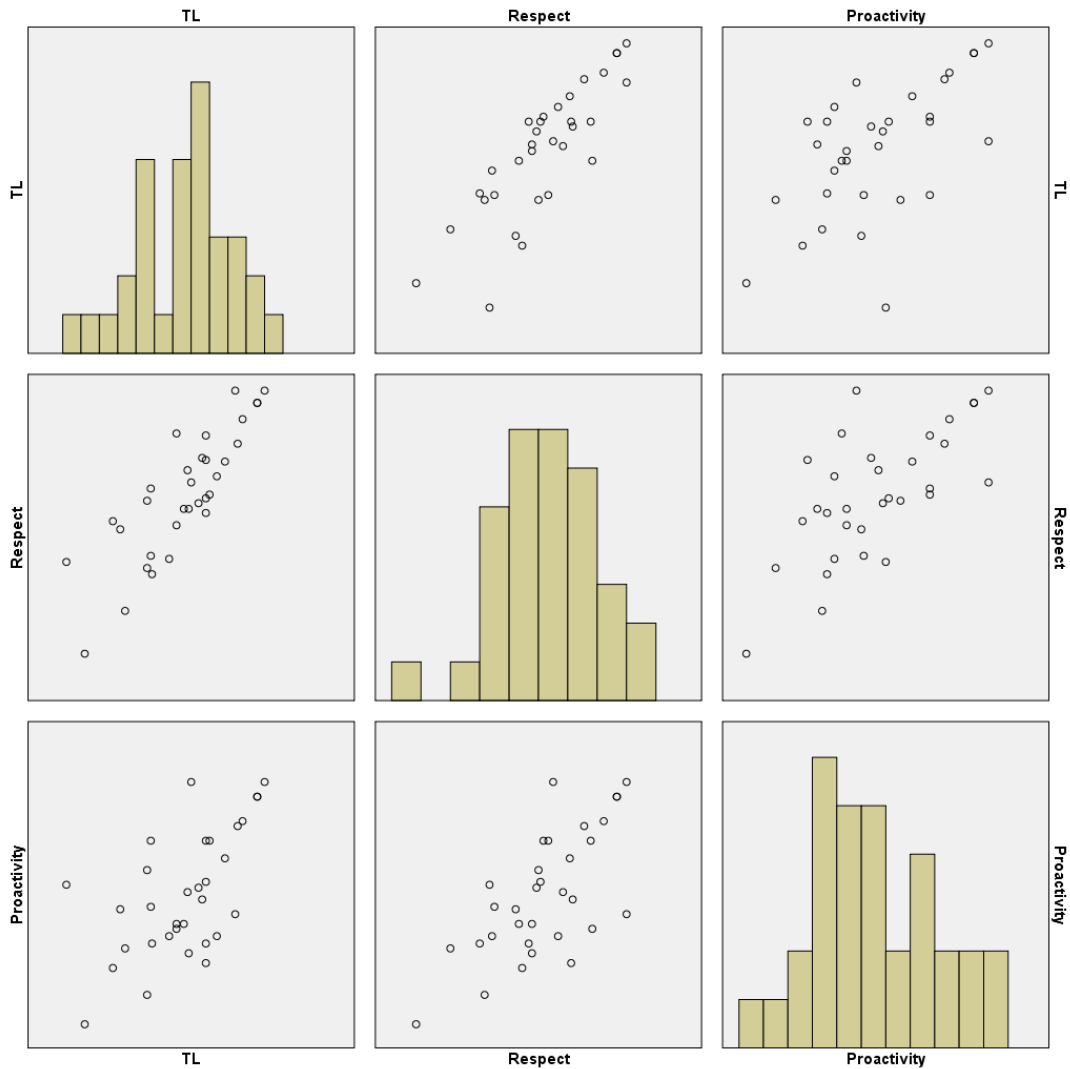


Figure 59: TL through Respect to Proactivity – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q plot (Figure 60) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

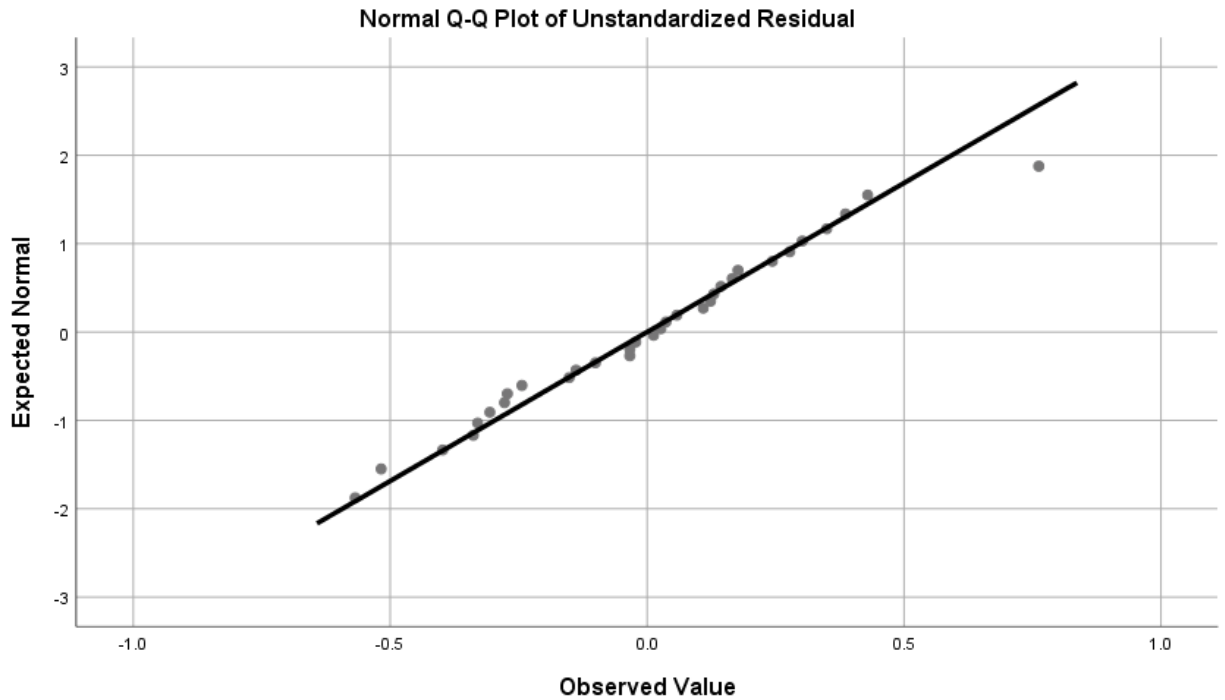


Figure 60: TL through Respect to Proactivity – Normality Q-Q Plot

The skewness and kurtosis (Table 22) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.052	
	95% Confidence Interval for Mean	Lower Bound	-.106	
		Upper Bound	.106	
	5% Trimmed Mean	-.004		
	Median	.019		
	Variance	.088		
	Std. Deviation	.296		
	Minimum	-.568		
	Maximum	.762		
	Range	1.330		
	Interquartile Range	.438		
	Skewness	.201	.414	
	Kurtosis	.134	.809	

Table 22: TL through Respect to Proactivity – Normality Descriptive Statistics

The histogram (Figure 61) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

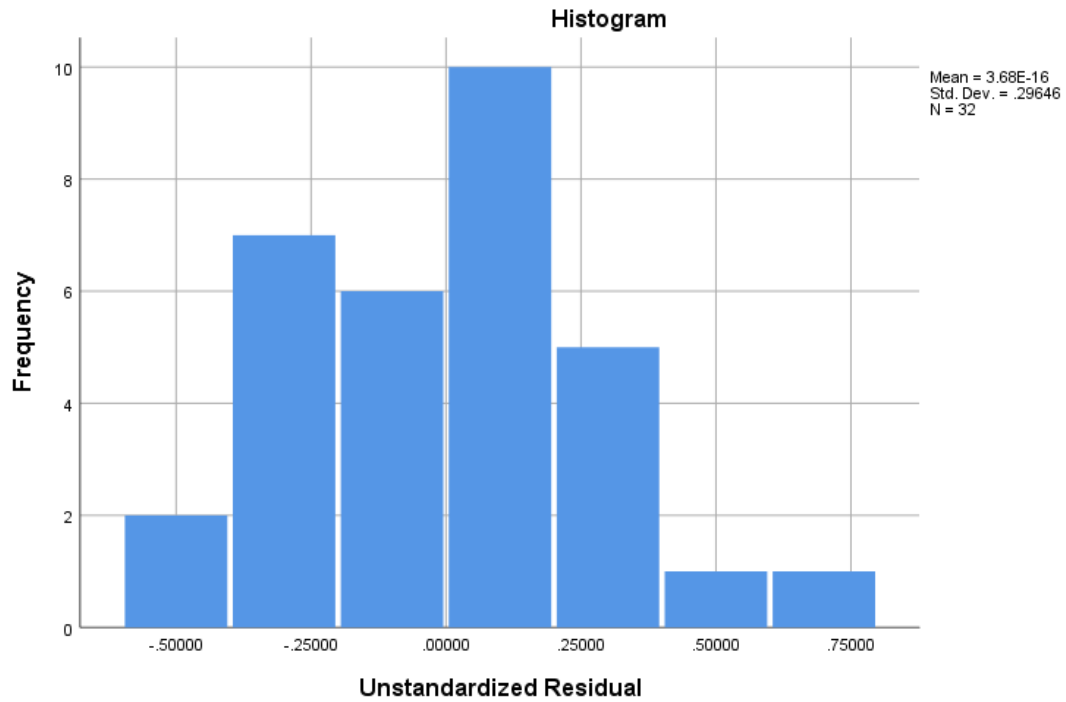


Figure 61: TL through Respect to Proactivity – Normality Histogram

The boxplot (Figure 62) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

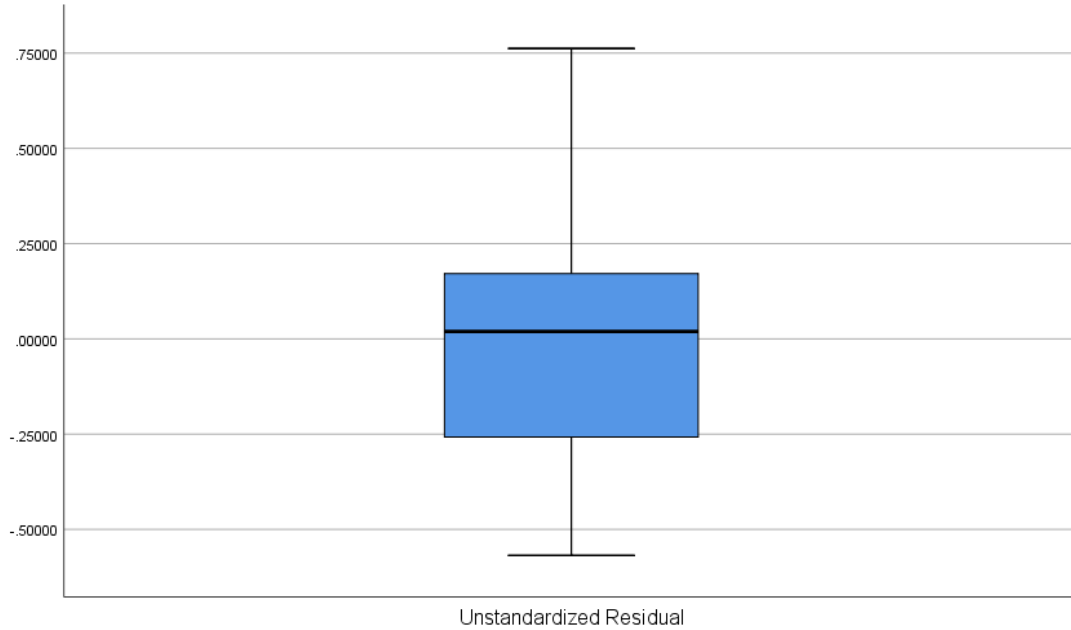


Figure 62: TL through Respect to Proactivity – Normality Boxplot

Both tests of normality (Table 23) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.080	32	.200*	.985	32	.924

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 23: TL through Respect to Proactivity – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 24) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Collinearity Statistics	
	Tolerance	VIF

1	(Constant)		
	TL	.293	3.411
	Respect	.288	3.467
	group	.969	1.032

Table 24: TL through Respect to Proactivity – Multicollinearity VIF

Only the eigenvalue (Table 25) of Group was close to 0, but the Group variable was nominal and not relevant. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Collinearity Diagnostics ^a							
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	TL	Respect	group
1	1	3.894	1.000	.00	.00	.00	.01
	2	.081	6.936	.00	.03	.00	.85
	3	.022	13.246	.32	.26	.00	.14
	4	.003	34.825	.67	.71	.99	.01

a. Dependent Variable: Proactivity

Table 25: TL through Respect to Proactivity – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Mediation model – TL through Respect to Innovation Work Behavior.

TL through Respect to Innovation Work Behavior - Outlier Analysis.

The centered leverage value (Figure 63) cut-off value was 0.28125 calculated as described in Chapter 3. Case 29 might be an outlier. But also cases 7, 9, and 11 required attention due to their Cook's D values.

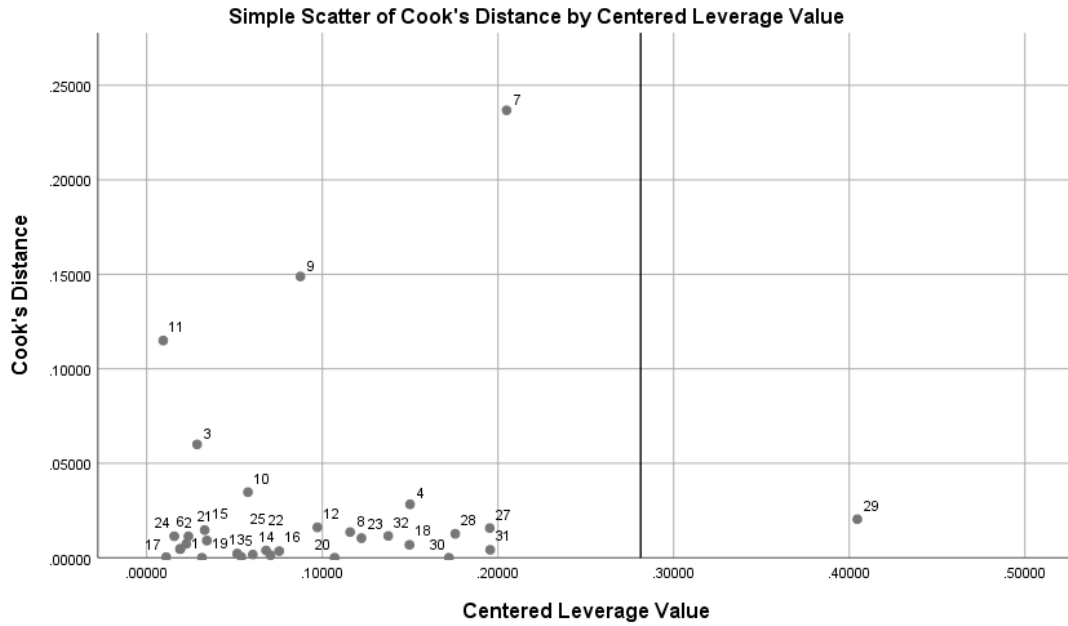


Figure 63: TL through Respect to IWB, Outlier Cook's D / Centered Leverage
Cases 9 and 11 might be outliers (Figure 64).

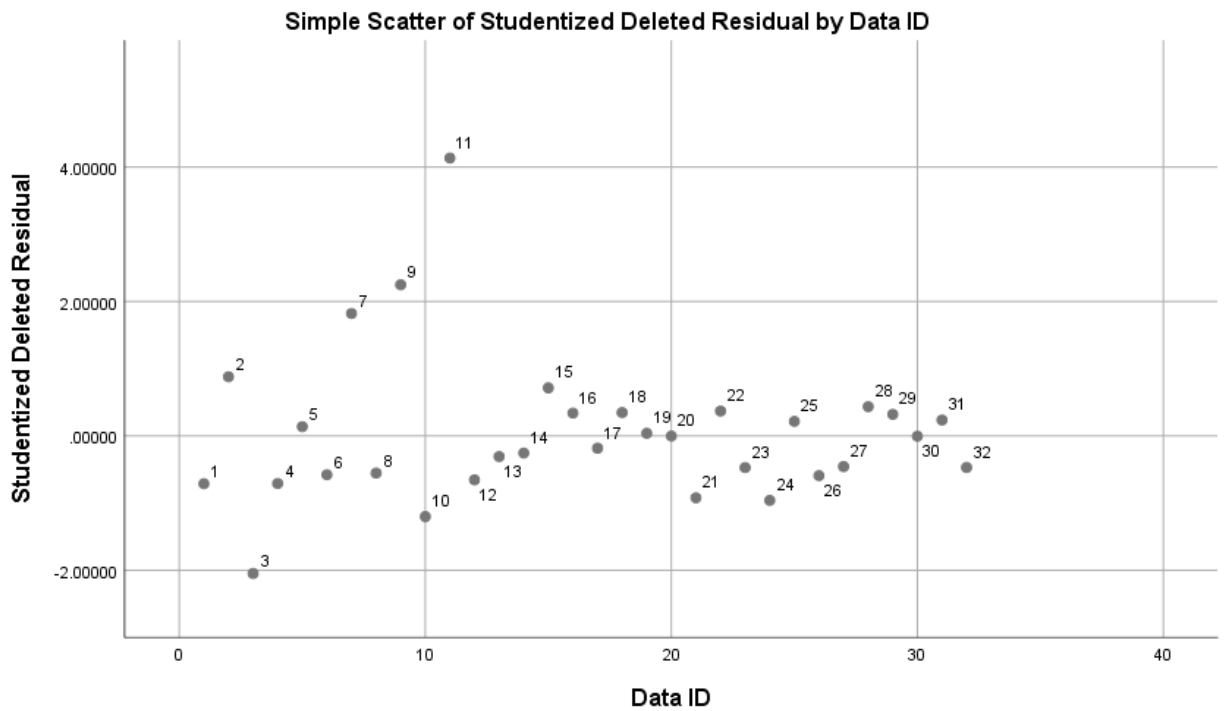


Figure 64: TL through Respect to IWB, Outlier Externally Studentized residuals

Cases 9 and 11 were identified two times as potential outliers. Both cases were excluded from the following mediation analysis.

TL through Respect to Innovation Work Behavior - Assumption Analysis.

Normality of Innovation Work Behavior.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 65 to 67), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with two exceptions. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

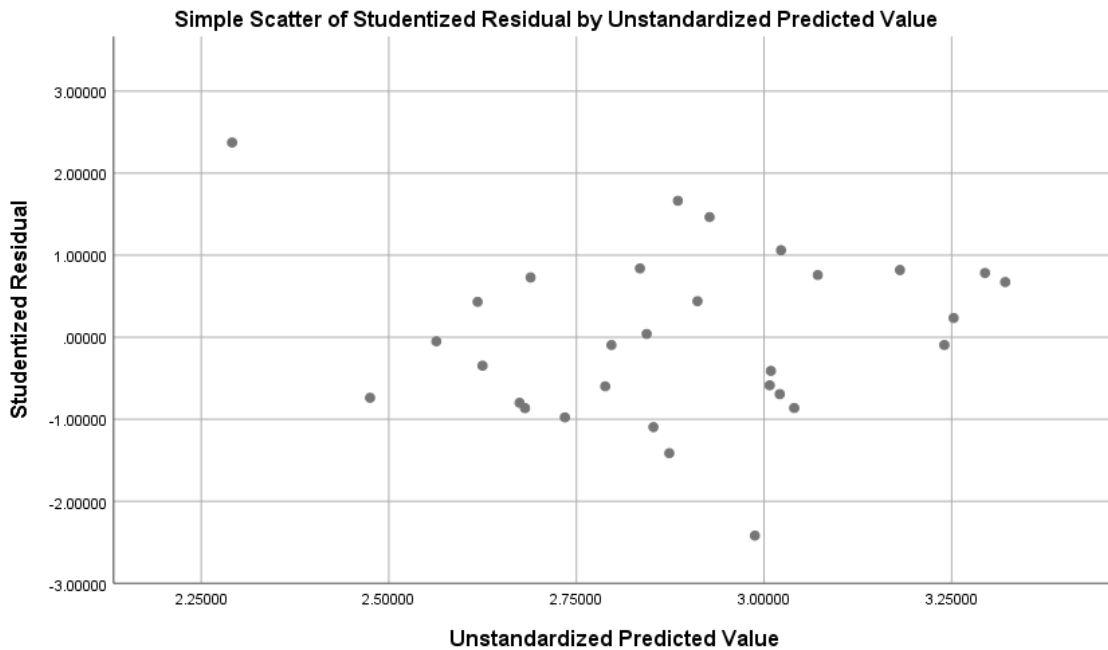


Figure 65: TL through Respect to IWB – Independence Plot 1

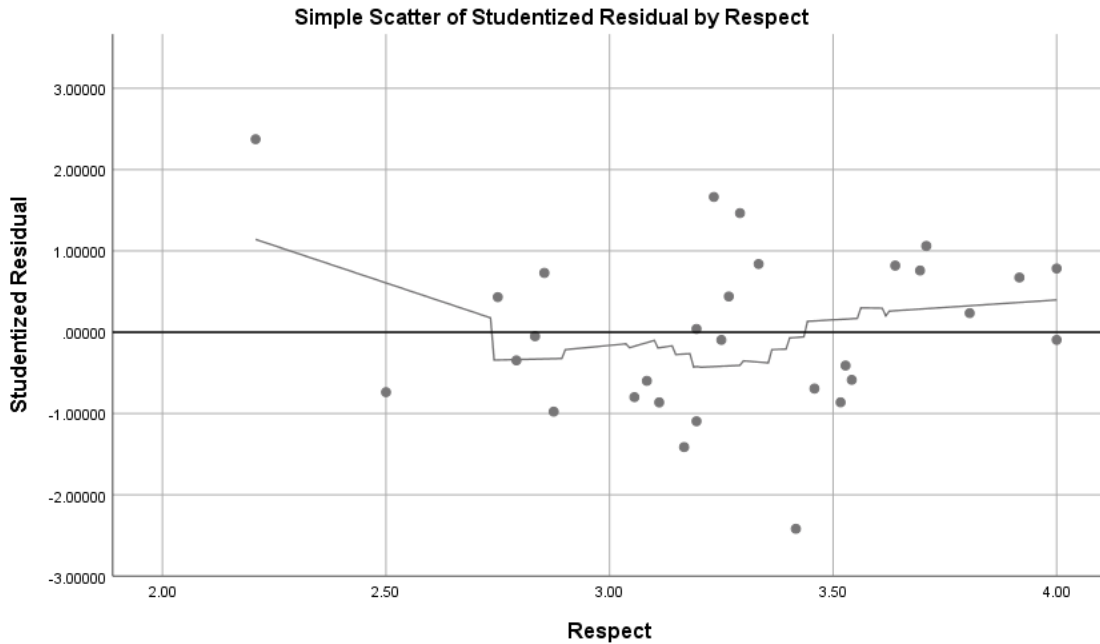


Figure 66: TL through Respect to IWB – Independence Plot 2

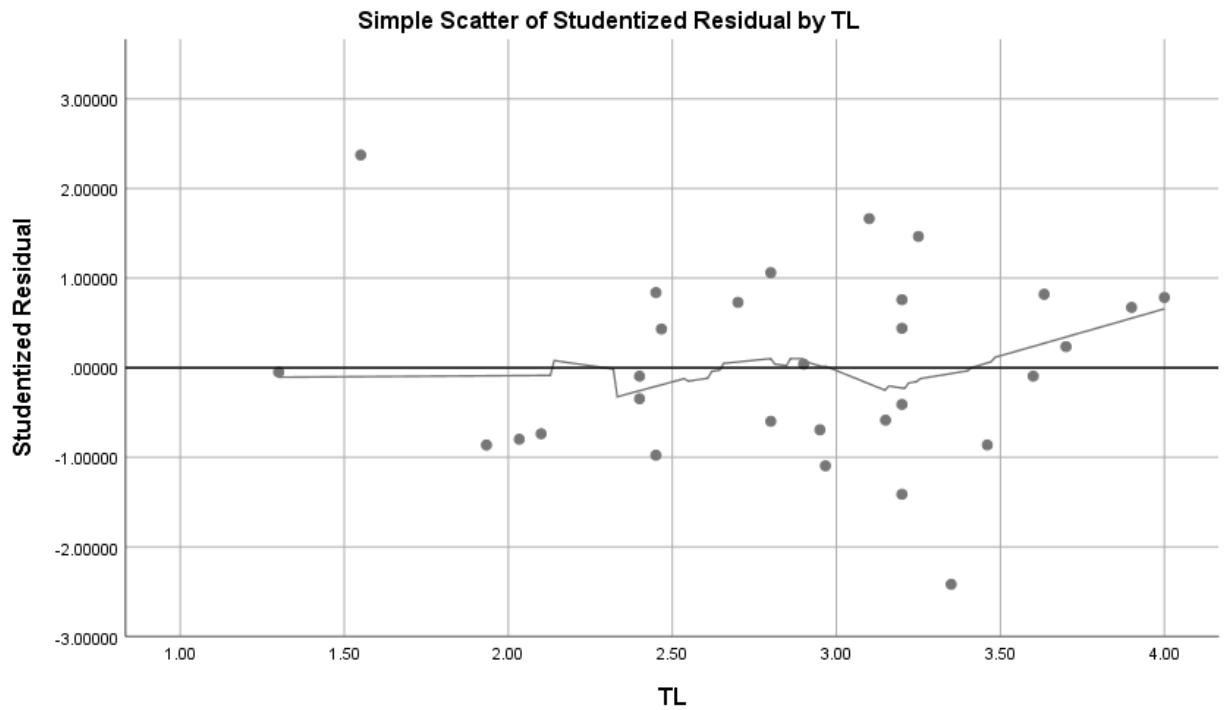


Figure 67: TL through Respect to IWB – Independence Plot 3

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 65 to 67) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 68) were produced between all independent and dependent variables. Only linear or random patterns were observable. Verifying above independence plots 2 and 3 linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

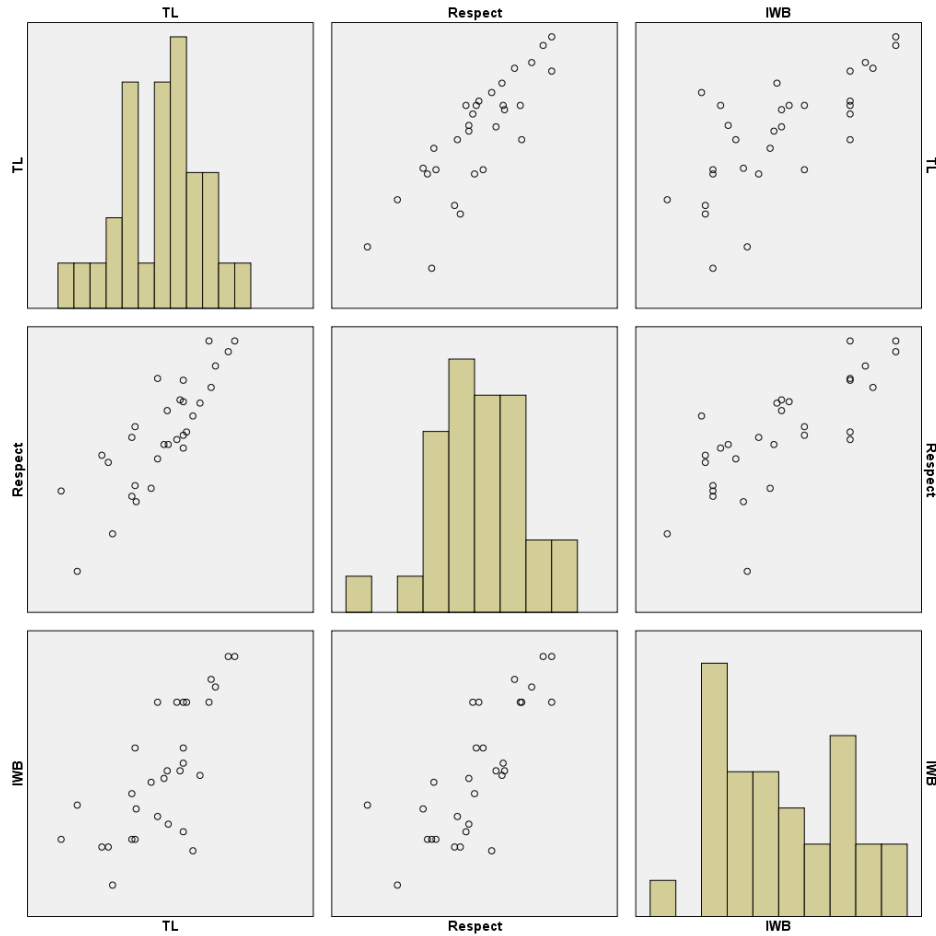


Figure 68: TL through Respect to IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values of the normal Q-Q plot (Figure 69) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

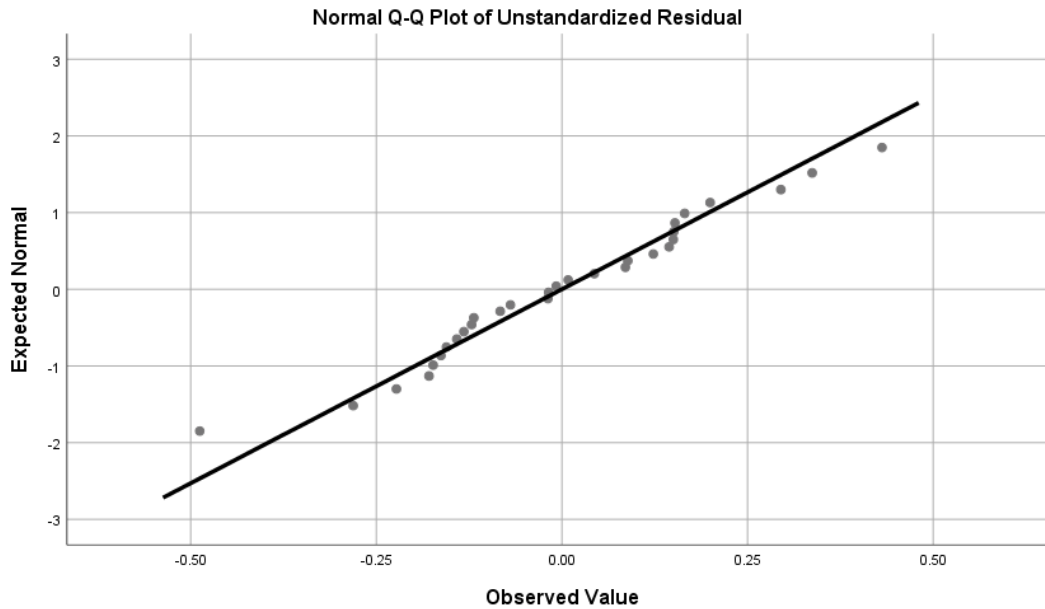


Figure 69: TL through Respect to IWB – Normality Q-Q Plot

The skewness and kurtosis (Table 26) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.036	
	95% Confidence Interval for Mean	Lower Bound	-.073	
		Upper Bound	.073	
	5% Trimmed Mean	.001		
	Median	-.012		
	Variance	.039		
	Std. Deviation	.197		
	Minimum	-.487		
	Maximum	.431		
	Range	.918		
	Interquartile Range	.295		
	Skewness	-.023	.427	
	Kurtosis	.256	.833	

Table 26: TL through Respect to IWB – Normality Descriptive Statistics

The histogram (Figure 70) reflected a challenge to the normal distribution (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

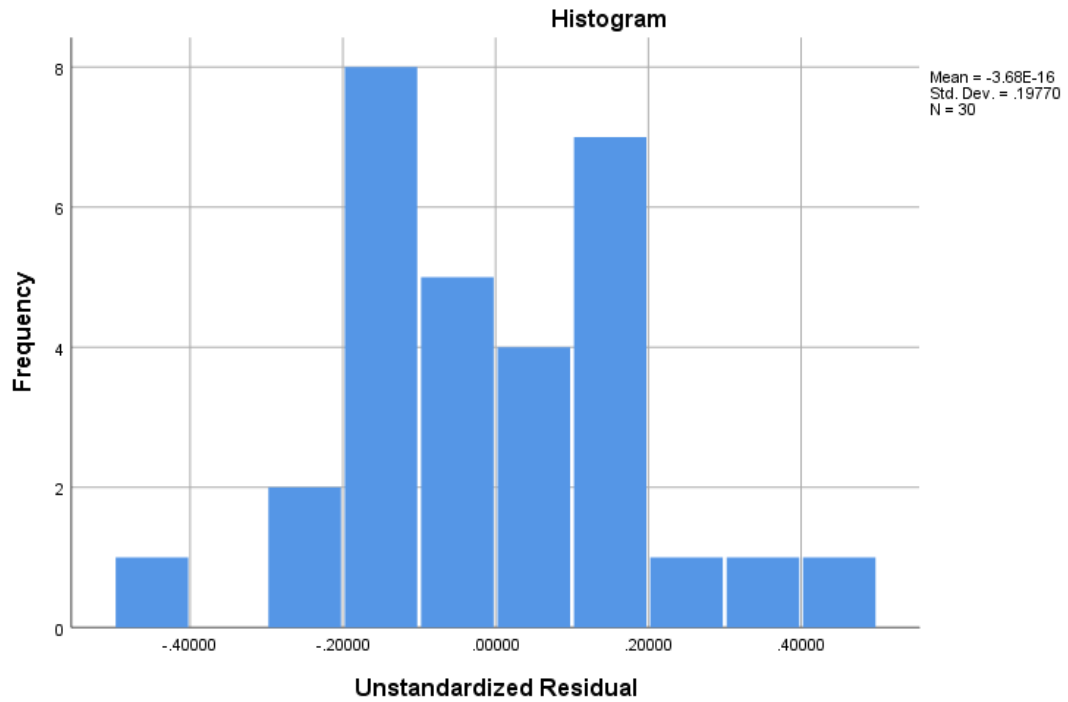


Figure 70: TL through Respect to IWB – Normality Histogram

The boxplot (Figure 71) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

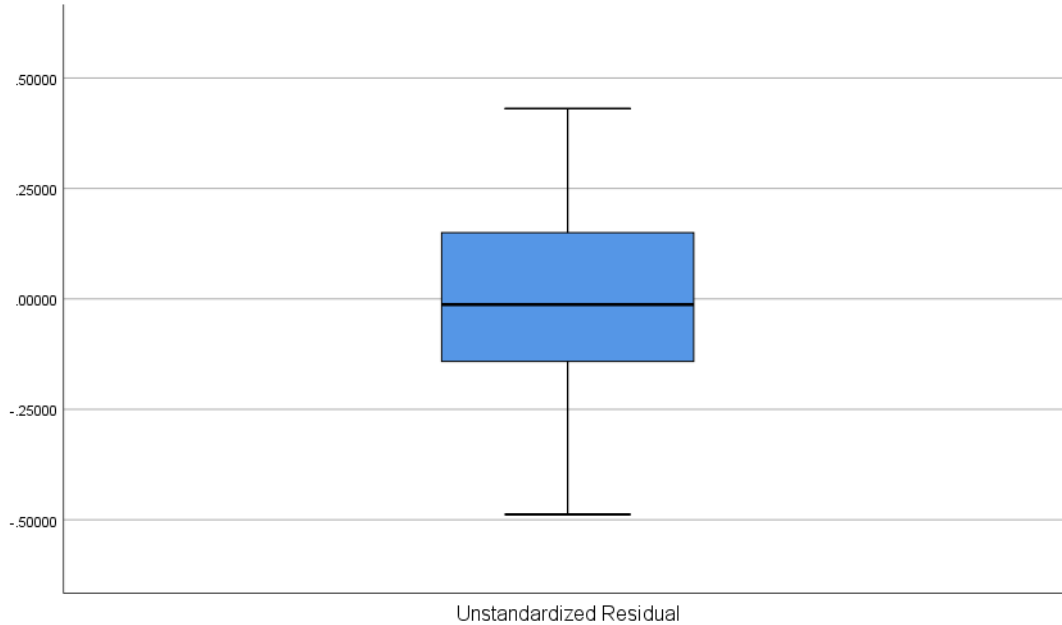


Figure 71: TL through Respect to IWB – Normality Boxplot

Both tests of normality (Table 27) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.092	30	.200*	.981	30	.851

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 27: TL through Respect to IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 28) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model

		Tolerance	VIF
1	(Constant)		
	Respect	.307	3.253
	TL	.314	3.181
	group	.961	1.041

Table 28: TL through Respect to IWB – Multicollinearity VIF

Only the eigenvalue (Table 29) of Group was close to 0, but the Group variable was nominal and not relevant. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	3.893
	2	.081
	3	.023
	4	.003

Table 29: TL through Respect to IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Double Mediation model – TL through Respect and Proactivity to Innovation Work Behavior.

TL through Respect and Proactivity to Innovation Work Behavior - Outlier Analysis.

The centered leverage value (Figure 72) cut-off value was 0.28125 calculated as described in Chapter 3. Case 29 might be outlier. But cases 7 and 11 required attention due to their Cook’s D values.

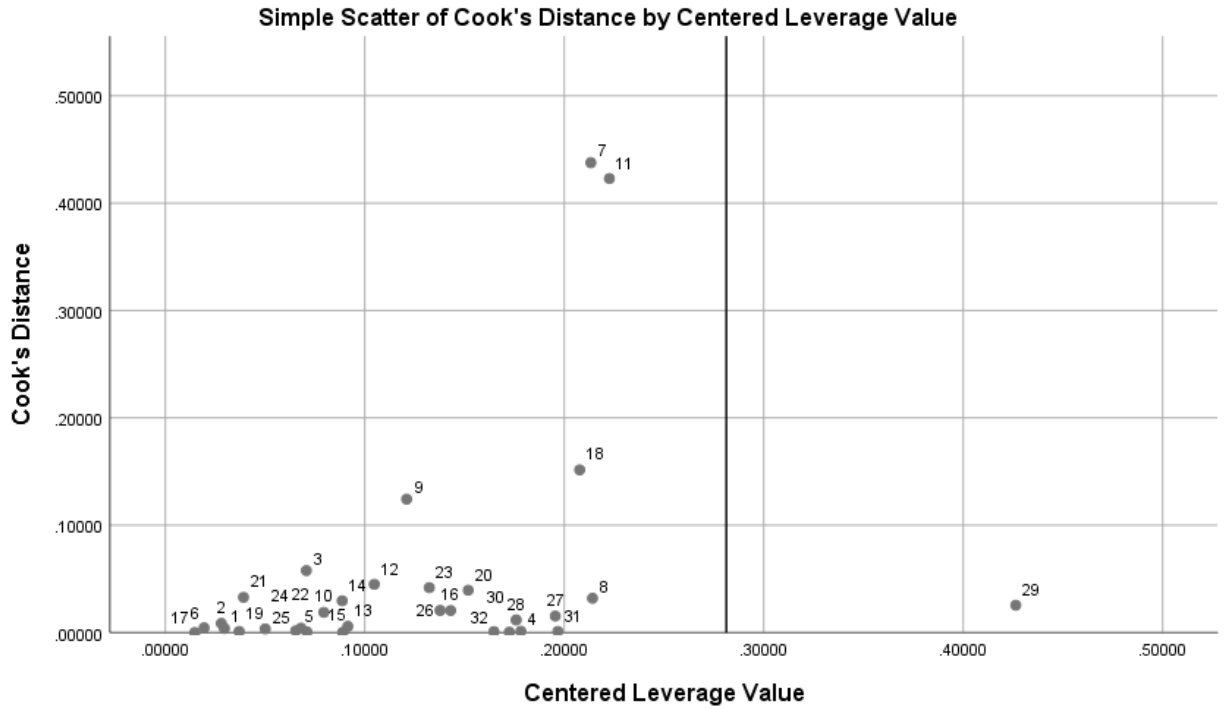


Figure 72: TL through Respect and Proactivity to IWB, Outlier Cook's D / Centered Leverage

Cases 7 and 11 might be outliers (Figure 73).

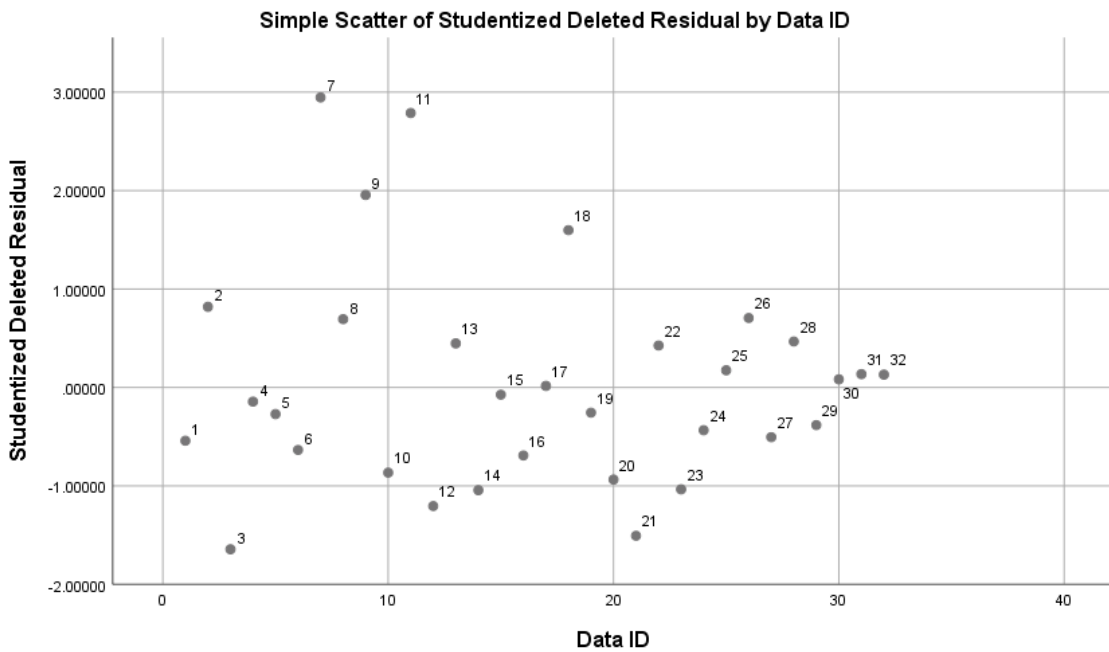


Figure 73: TL through Respect and Proactivity to IWB, Outlier Externally Studentized residuals

Cases 7 and 11 were identified two times as potential outliers. Both cases were excluded from the following mediation analysis.

TL through Respect and Proactivity to Innovation Work Behavior – Assumption Analysis.

Normality of IWB.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figure 74 to 77) it could be observed that the values fell within a band of -2 to 2 on the Y-axis with two exceptions not outside of absolute value 3. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

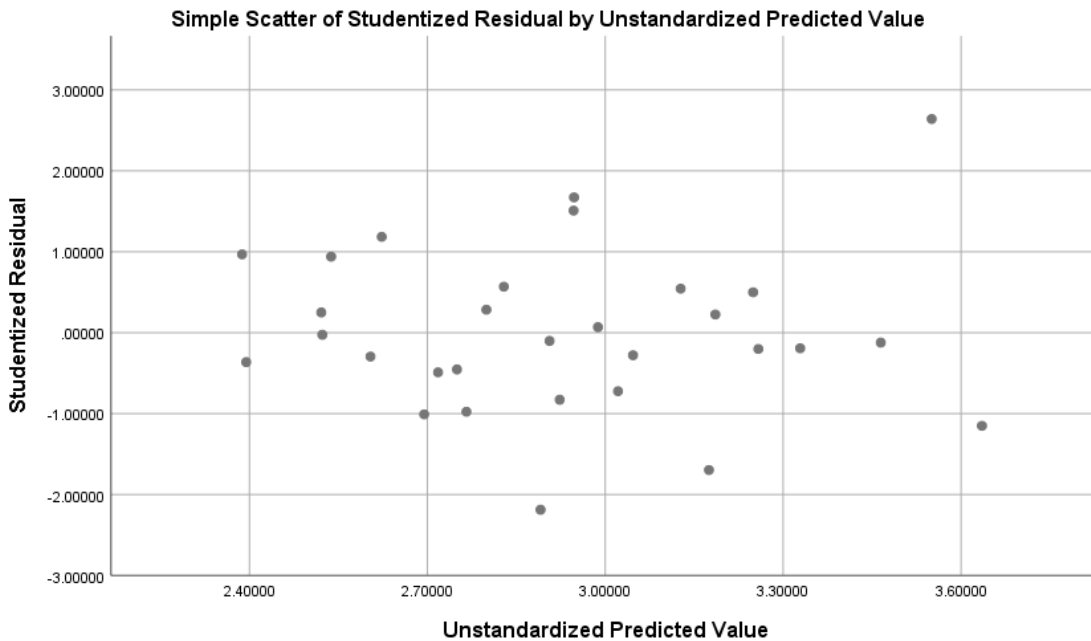


Figure 74: TL through Respect and Proactivity to IWB – Independence Plot 1

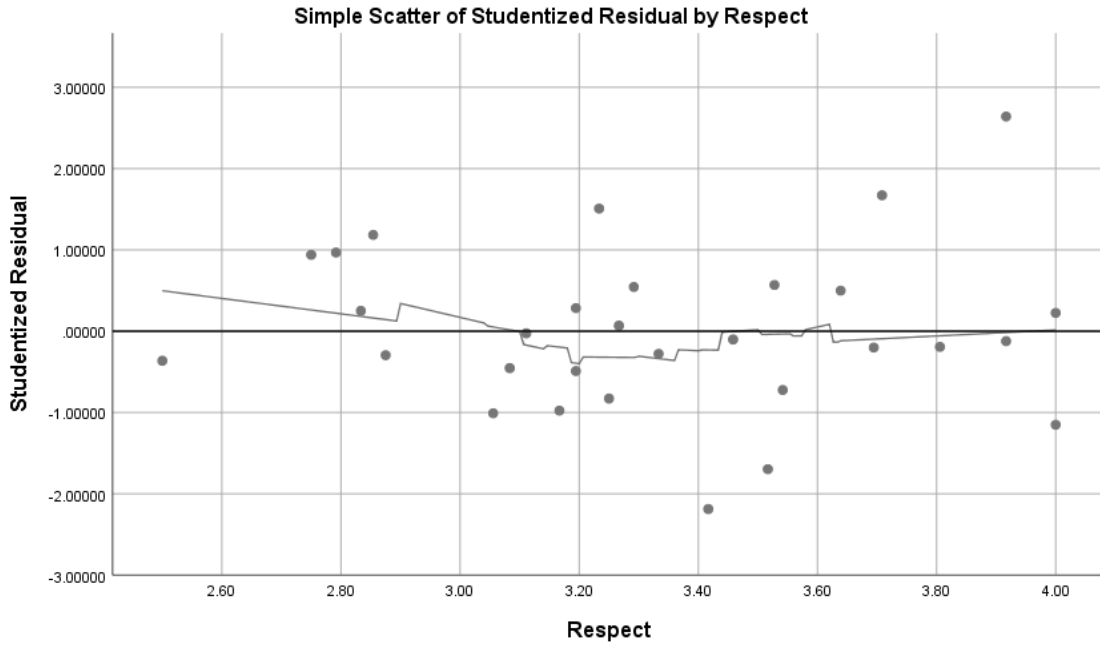


Figure 75: TL through Respect and Proactivity to IWB – Independence Plot 2

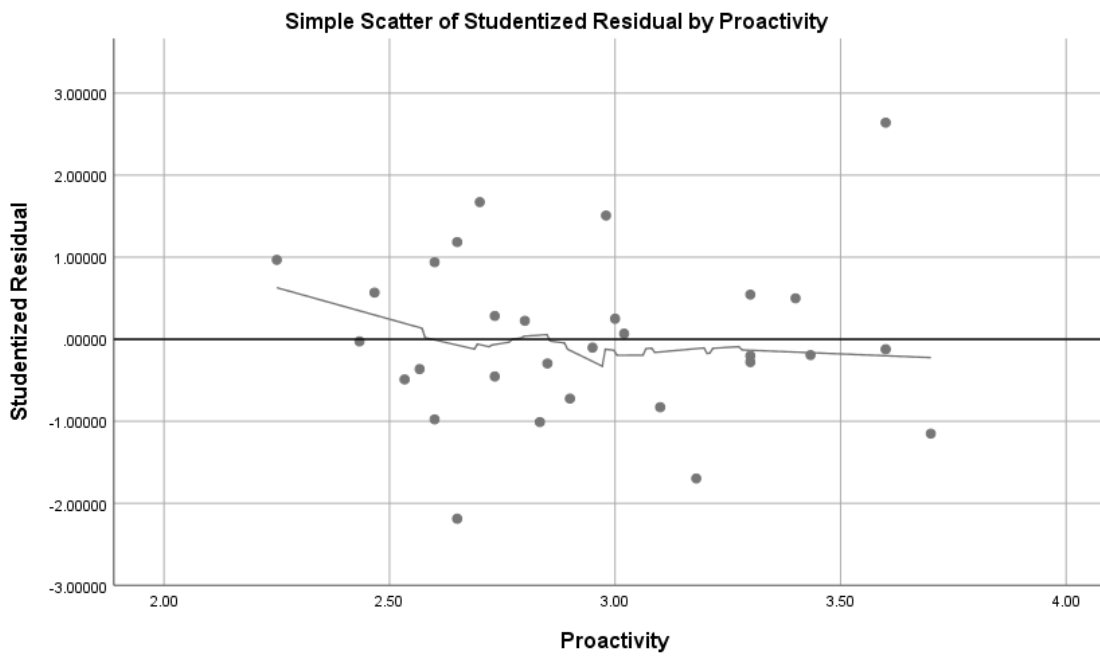


Figure 76: TL through Respect and Proactivity to IWB – Independence Plot 3

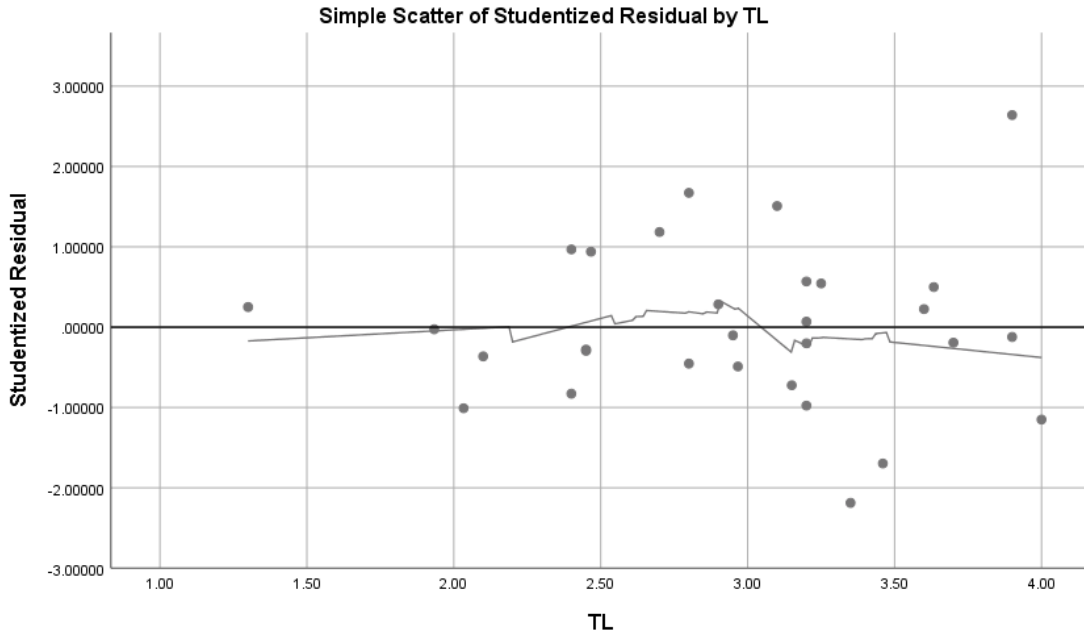


Figure 77: TL through Respect and Proactivity to IWB – Independence Plot 4

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 74 to 77) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 78) were produced between all independent and dependent variables. Only linear or random patterns were observable. Verifying above

independence plots, linear patterns were supported (Figures 75 to 77) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

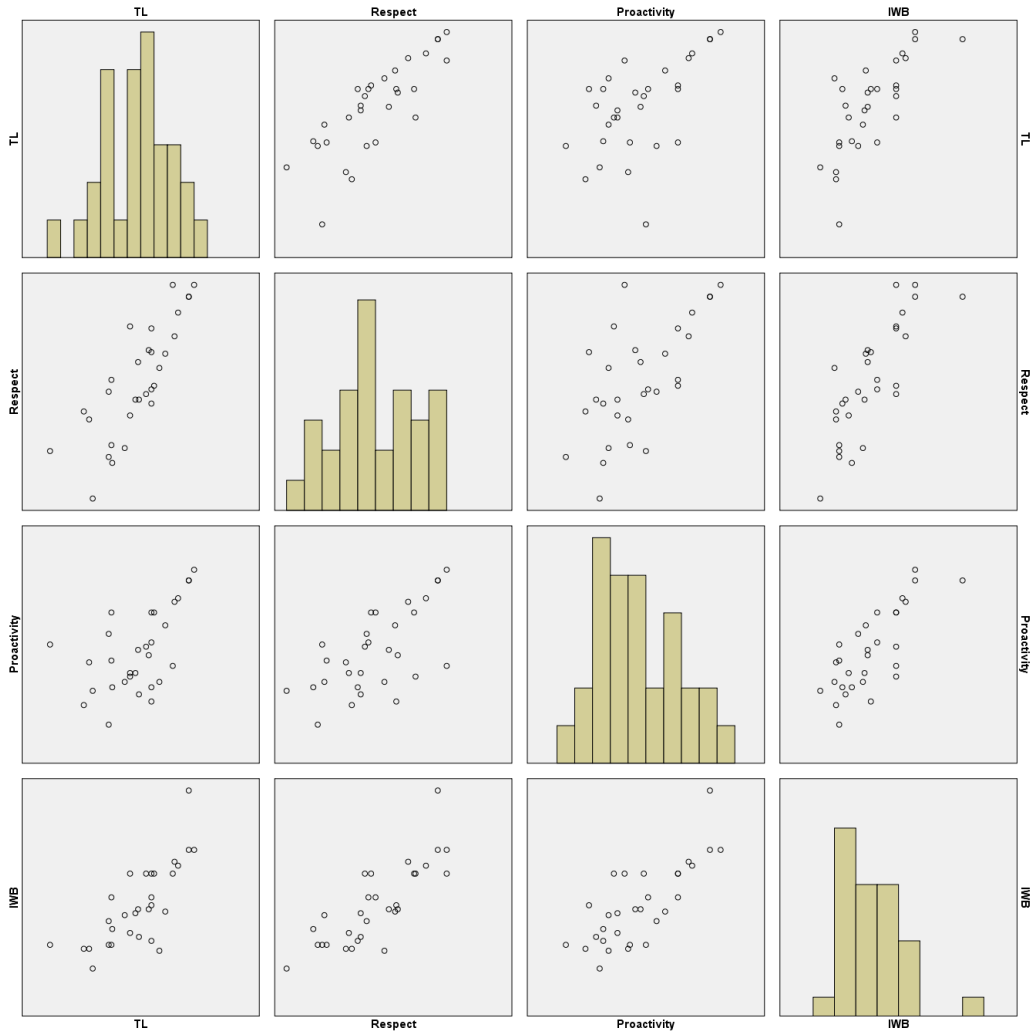


Figure 78: TL through Respect and Proactivity to IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the Normal Q-Q plot (Figure 79) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

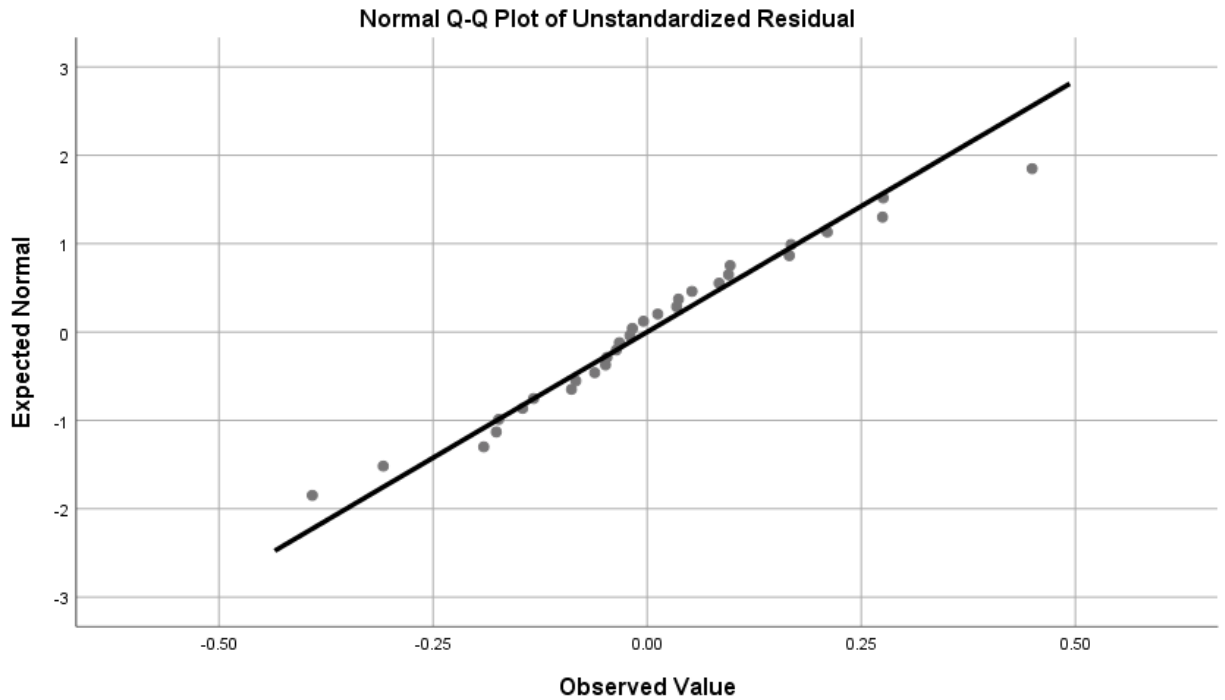


Figure 79: TL through Respect and Proactivity to IWB – Normality Q-Q Plot

The skewness and kurtosis (Table 30) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.032	
	95% Confidence Interval for Mean	Lower Bound	-.065	
		Upper Bound	.065	
	5% Trimmed Mean	-.001		
	Median	-.018		
	Variance	.031		
	Std. Deviation	.175		
	Minimum	-.390		
	Maximum	.449		
	Range	.840		
	Interquartile Range	.194		
	Skewness	.272	.427	
	Kurtosis	.787	.833	

Table 30: TL through Respect and Proactivity to IWB – Normality Descriptive Statistics

The histogram (Figure 80) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

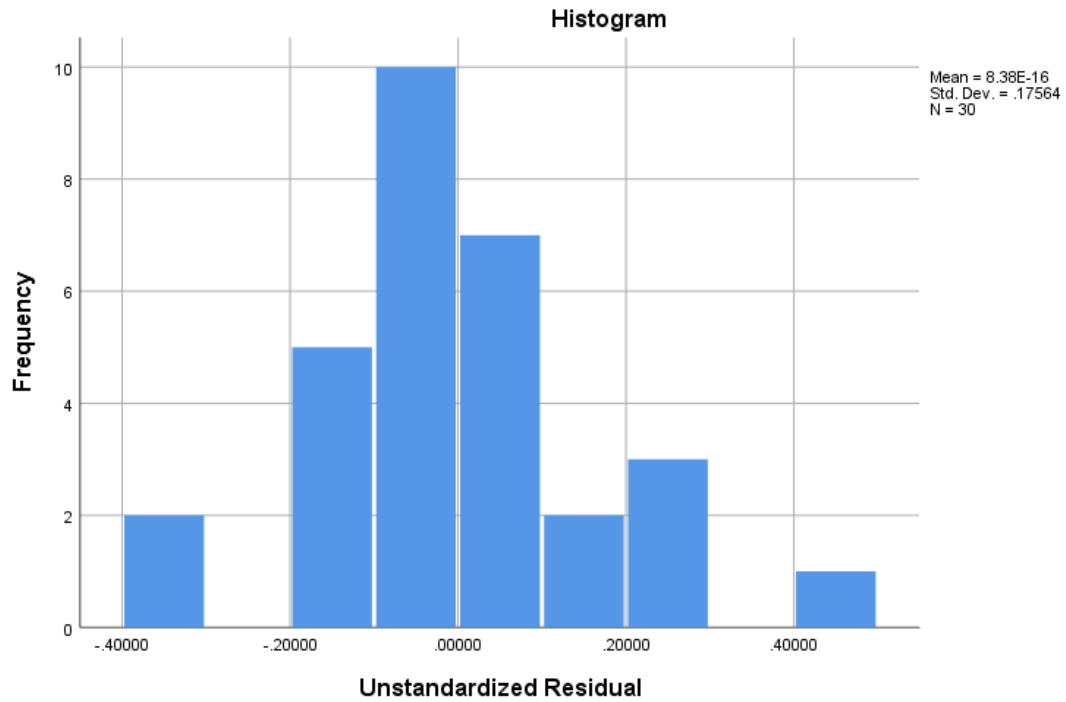


Figure 80: TL through Respect and Proactivity to IWB – Normality Histogram

The boxplot (Figure 81) reflected a challenge to normal distribution (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

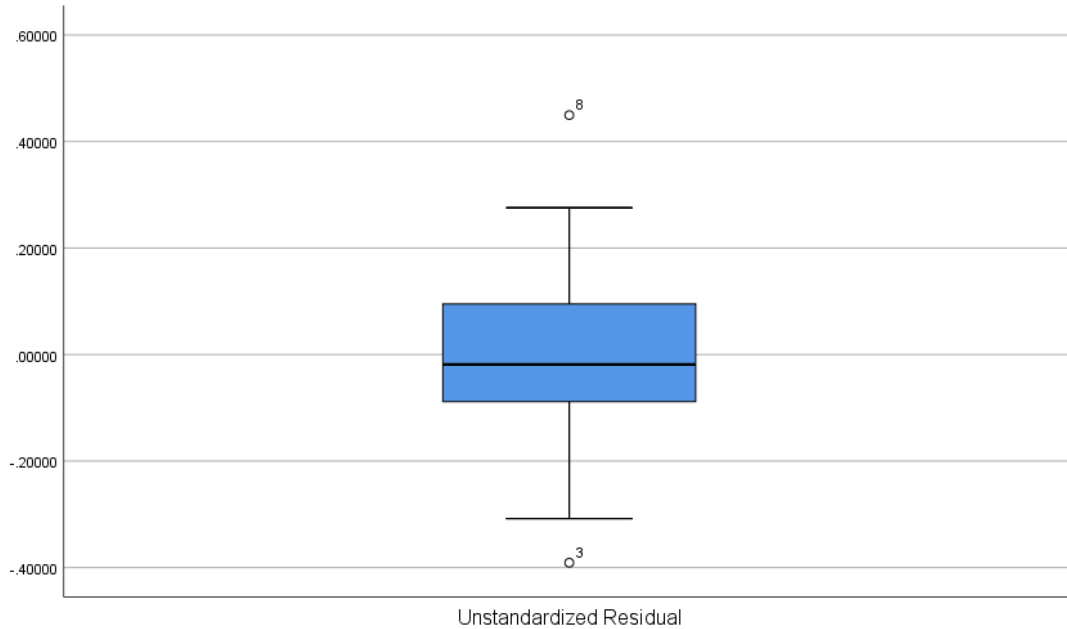


Figure 81: TL through Respect and Proactivity to IWB – Normality Boxplot
 Both tests of normality (Table 31) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.091	30	.200*	.981	30	.863

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 31: TL through Respect and Proactivity to IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 32) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012 and Cohen, Cohen, West & Aiken, 2013).

Model	Tolerance	VIF
-------	-----------	-----

1	(Constant)		
	TL	.334	2.990
	Respect	.288	3.469
	Proactivity	.495	2.021
	group	.833	1.200

Table 32: TL through Respect and Proactivity to IWB – Multicollinearity VIF

Only the eigenvalue (Table 33) of Proactivity was close to 0. The Group variable was nominal and not relevant. A regression between Proactivity and the other independent variables produced an R^2 of .505 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	4.886
	2	.084
	3	.021
	4	.006
	5	.003

Table 33: TL through Respect and Proactivity to IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Double Mediation model – CR through Respect and Proactivity to Innovation Work Behavior.

CR through Respect and Proactivity to Innovation Work Behavior - Outlier Analysis.

The centered leverage value (Figure 82) cut-off value was 0.28125 calculated as described in Chapter 3. Case 8 and 29 might be an outlier. But cases 7 and 11 require attention due to their Cook's D values.

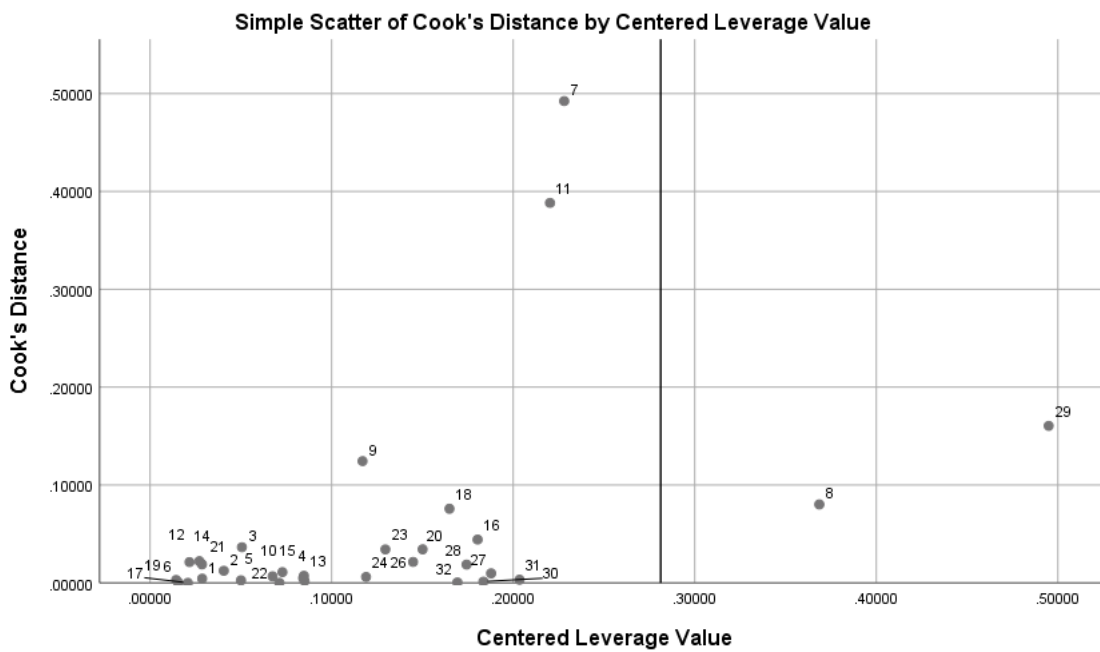


Figure 82: CR through Respect and Proactivity to IWB, Outlier Cook's D / Centered Leverage

Cases 7 and 11 might be outliers (Figure 83).

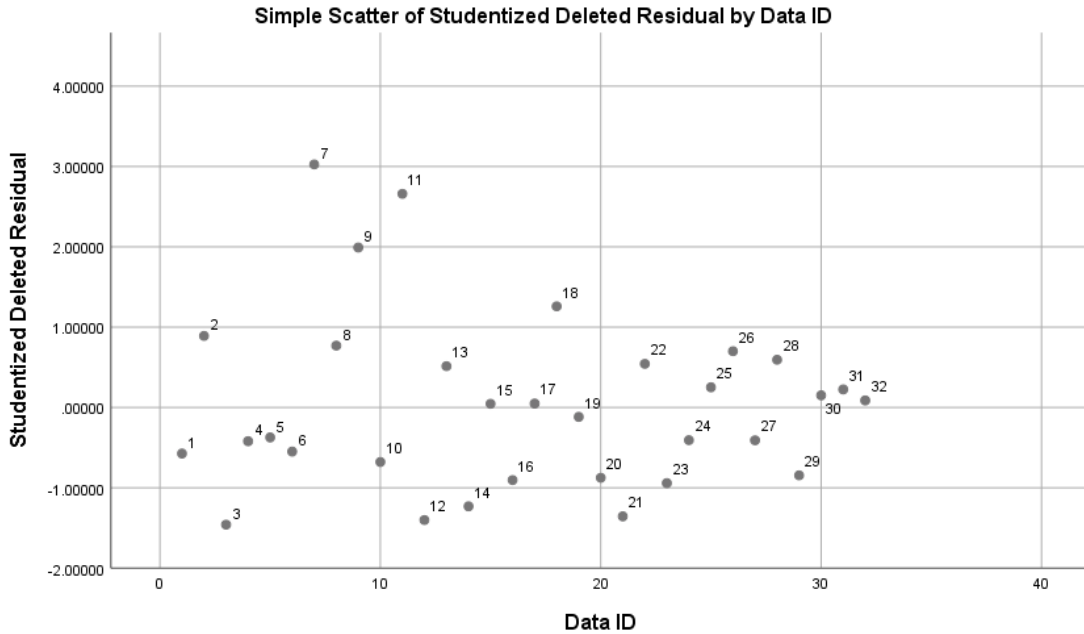


Figure 83: CR through Respect and Proactivity to IWB, Outlier Externally Studentized residuals

Cases 7 and 11 were identified two times as potential outliers. Both cases were excluded from the following mediation analysis.

CR through Respect and Proactivity to Innovation Work Behavior - Assumption

Analysis.

Normality of Innovation Work Behavior.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 84 to 87), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with one exception, still inside absolute value 3. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

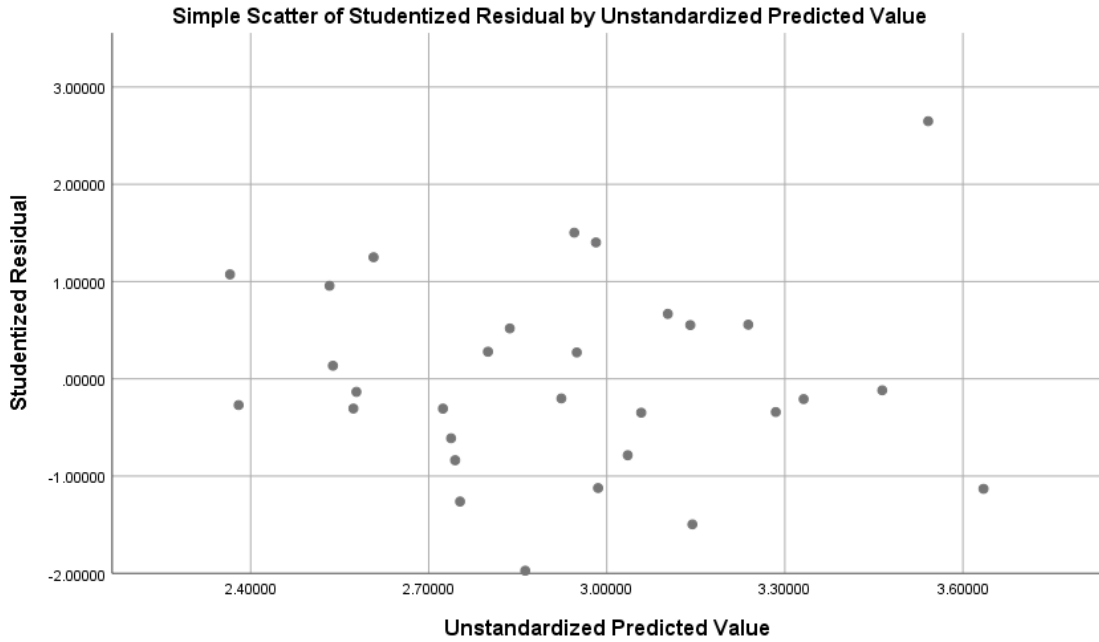


Figure 84: CR through Respect and Proactivity to IWB – Independence Plot 1

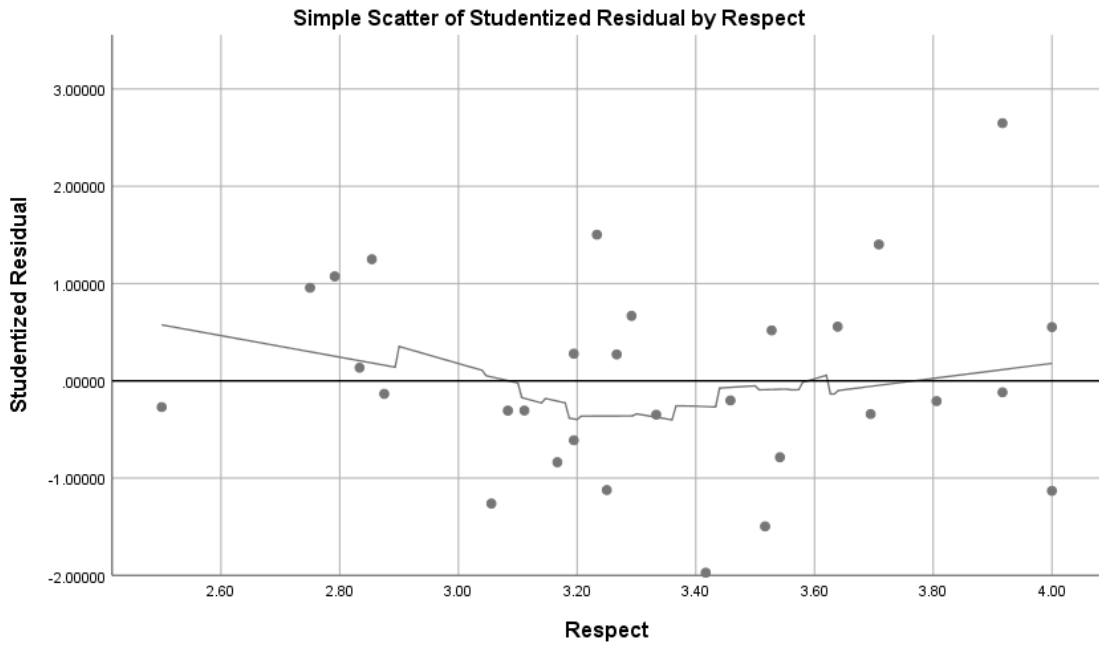


Figure 85: CR through Respect and Proactivity to IWB – Independence Plot 2

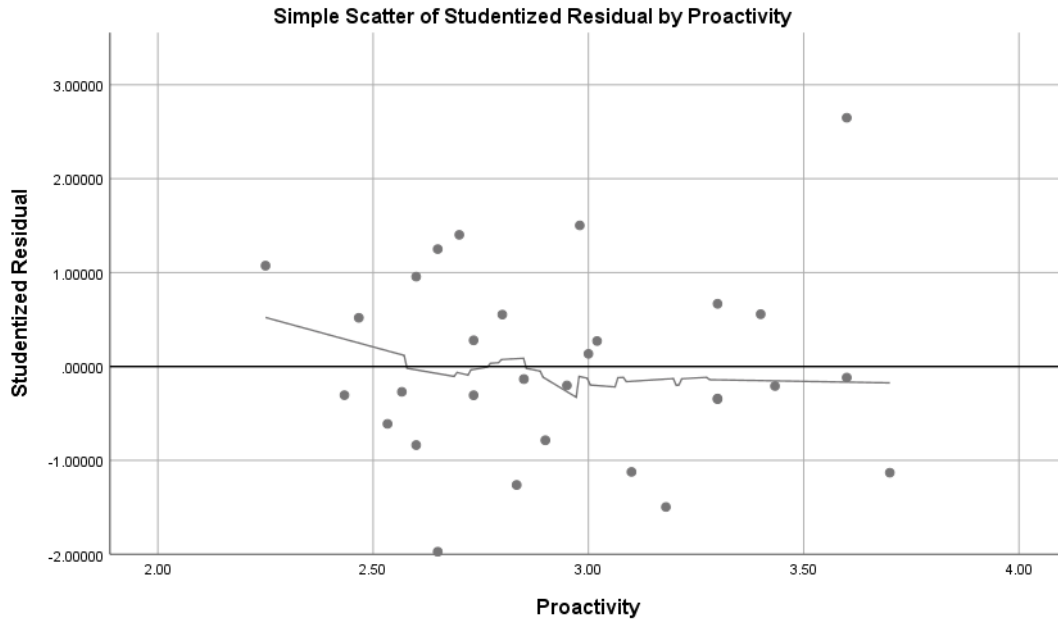


Figure 86: CR through Respect and Proactivity to IWB – Independence Plot 3

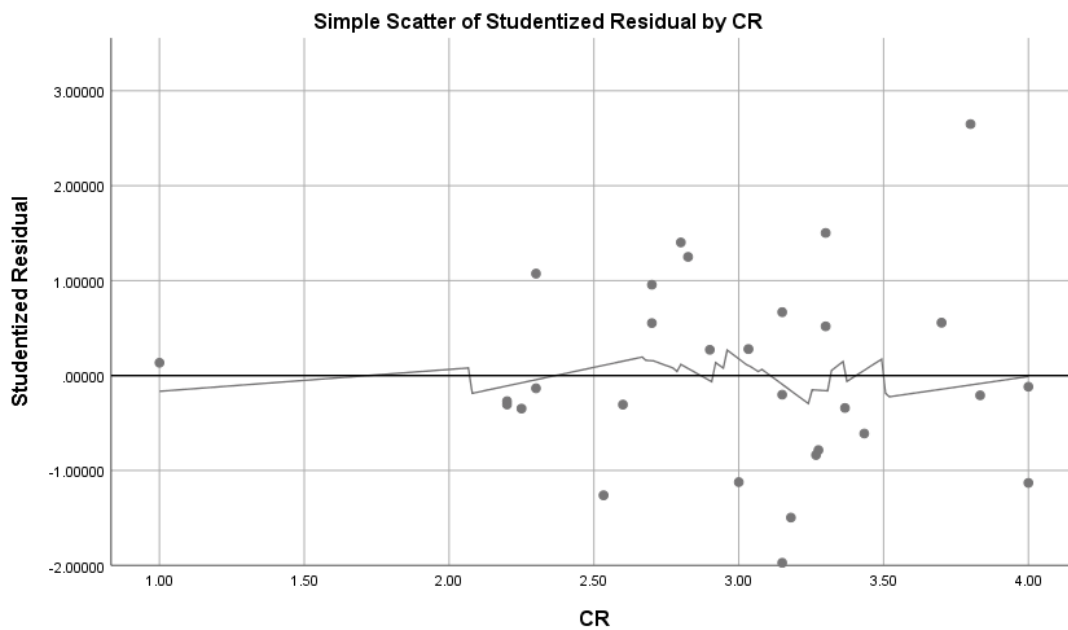


Figure 87: CR through Respect and Proactivity to IWB – Independence Plot 4

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 84 to 87) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

linearity.

Multiple scatterplots (Figure 88) were produced between all independent and dependent variables. Only linear and random patterns were observable. Verifying above independence plots, linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

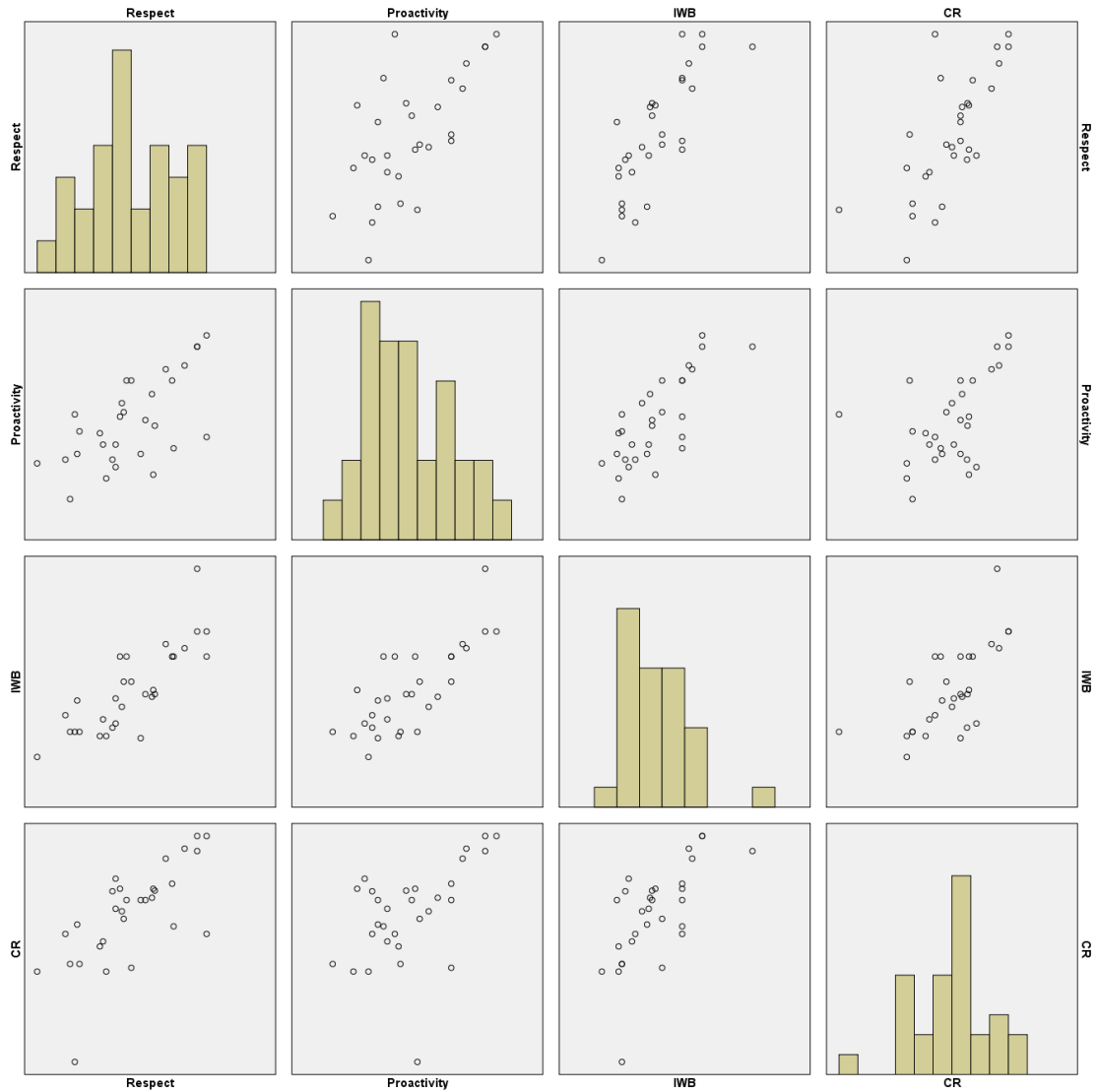


Figure 88: CR through Respect and Proactivity to IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q plot (Figure 89) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

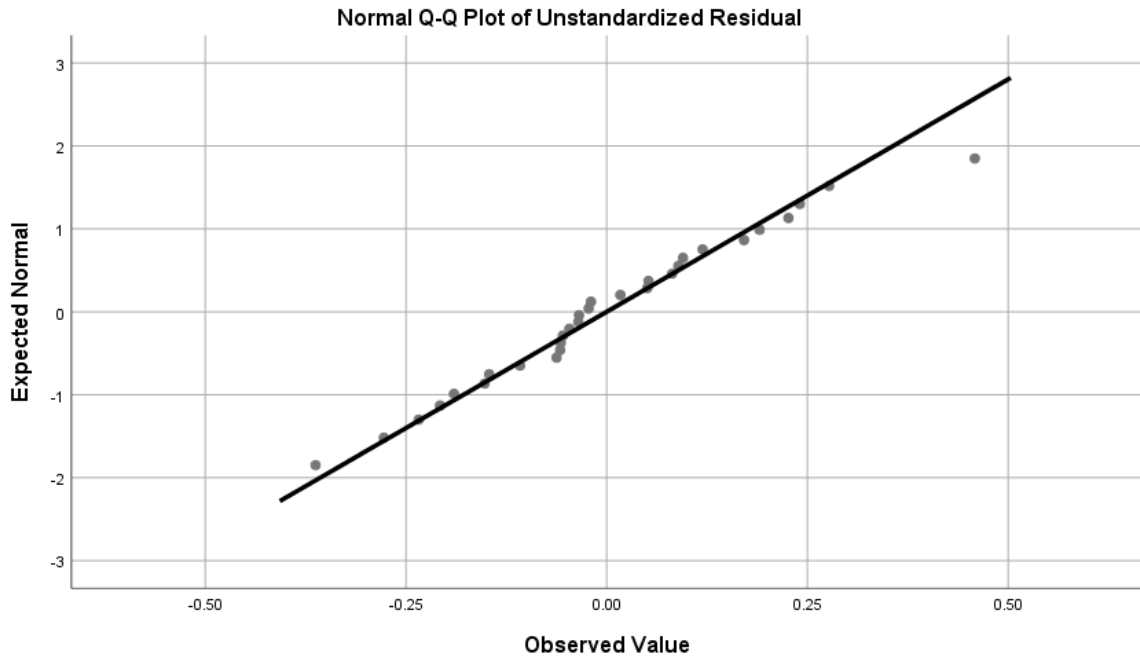


Figure 89: CR through Respect and Proactivity to IWB – Normality Q-Q Plot

The skewness and kurtosis (Table 34) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.032	
	95% Confidence Interval for Mean	Lower Bound	-.066	
		Upper Bound	.066	
	5% Trimmed Mean	-.003		
	Median	-.028		
	Variance	.032		
	Std. Deviation	.178		
	Minimum	-.362		
	Maximum	.458		
	Range	.821		
	Interquartile Range	.218		
	Skewness	.342	.427	
	Kurtosis	.400	.833	

Table 34: CR through Respect and Proactivity to IWB – Normality Descriptive Statistics

The histogram (Figure 90) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

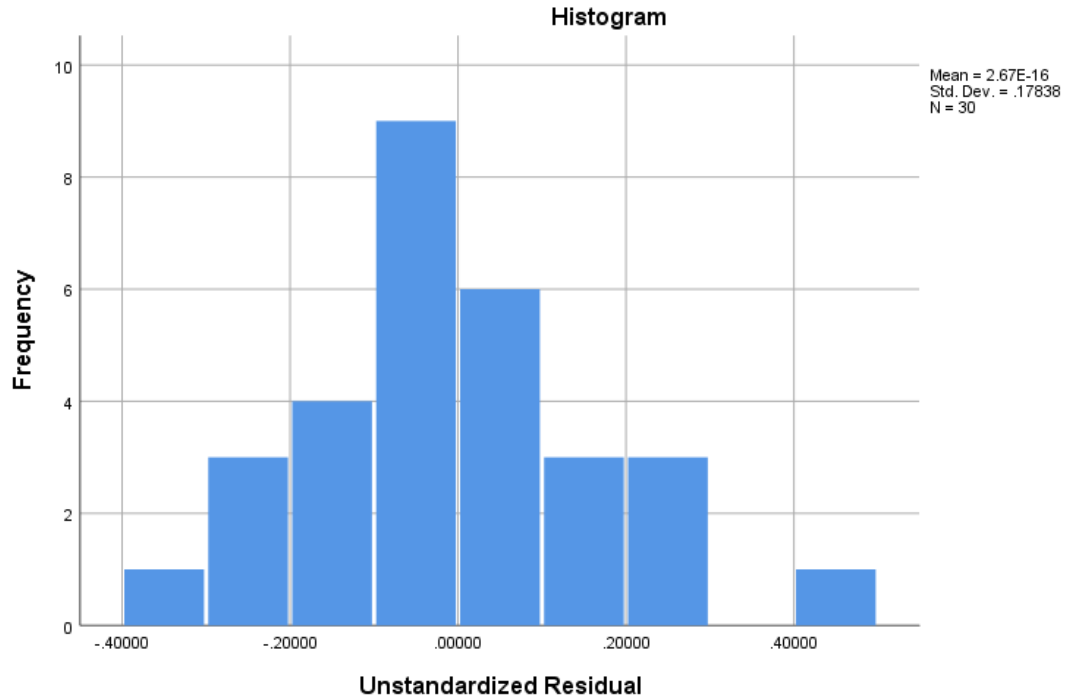


Figure 90: CR through Respect and Proactivity to IWB – Normality Histogram

The box plot (Figure 91) reflected a challenge to the normal distribution (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

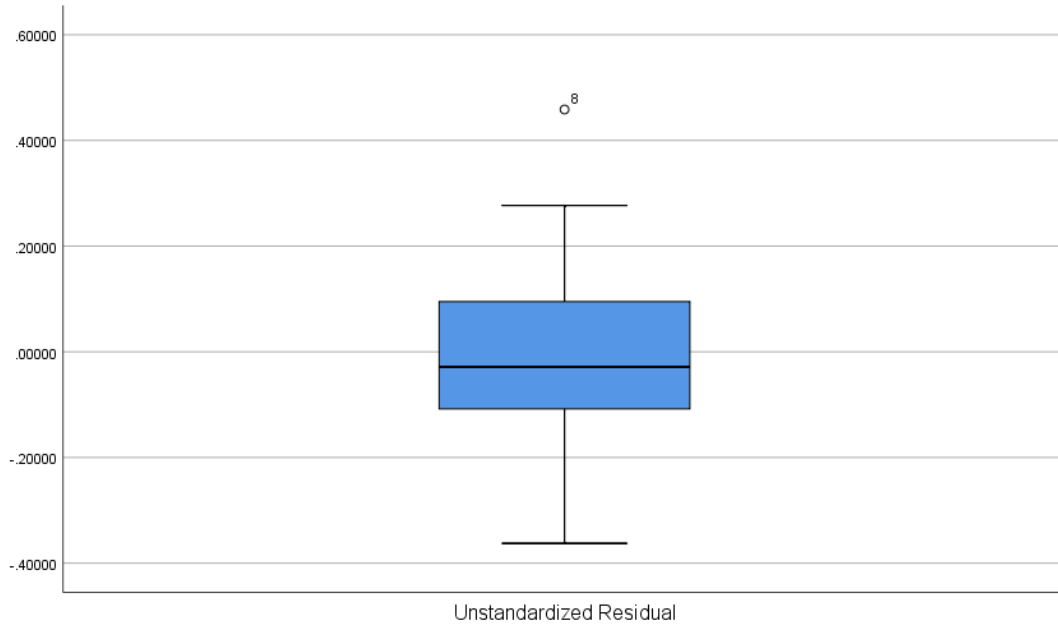


Figure 91: CR through Respect and Proactivity to IWB – Normality Boxplot

Both tests of normality (Table 35) provided non-significant tests results

supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.110	30	.200*	.985	30	.945

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 35: CR through Respect and Proactivity to IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 36) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model

		Tolerance	VIF
1	(Constant)		
	CR	.484	2.068
	Respect	.391	2.560
	Proactivity	.491	2.039
	group	.834	1.199

Table 36: CR through Respect and Proactivity to IWB – Multicollinearity VIF

Only the eigenvalue (Table 37) of Proactivity was close to 0. The Group variable is nominal and not relevant. A regression between Proactivity and the other independent variables produced an R^2 of .509 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	4.885
	2	.084
	3	.021
	4	.007
	5	.004

Table 37: CR through Respect and Proactivity to IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Double Mediation Model – MBEA through Respect and Proactivity to Innovation Work Behavior.

MBEA through Respect and Proactivity to Innovation Work Behavior - Outlier

Analysis.

The centered leverage value (Figure 92) cut-off value was 0.28125 calculated as described in Chapter 3. Case 8 and 18 might be an outlier. But cases 7 and 11 required attention due to their Cook's D values.

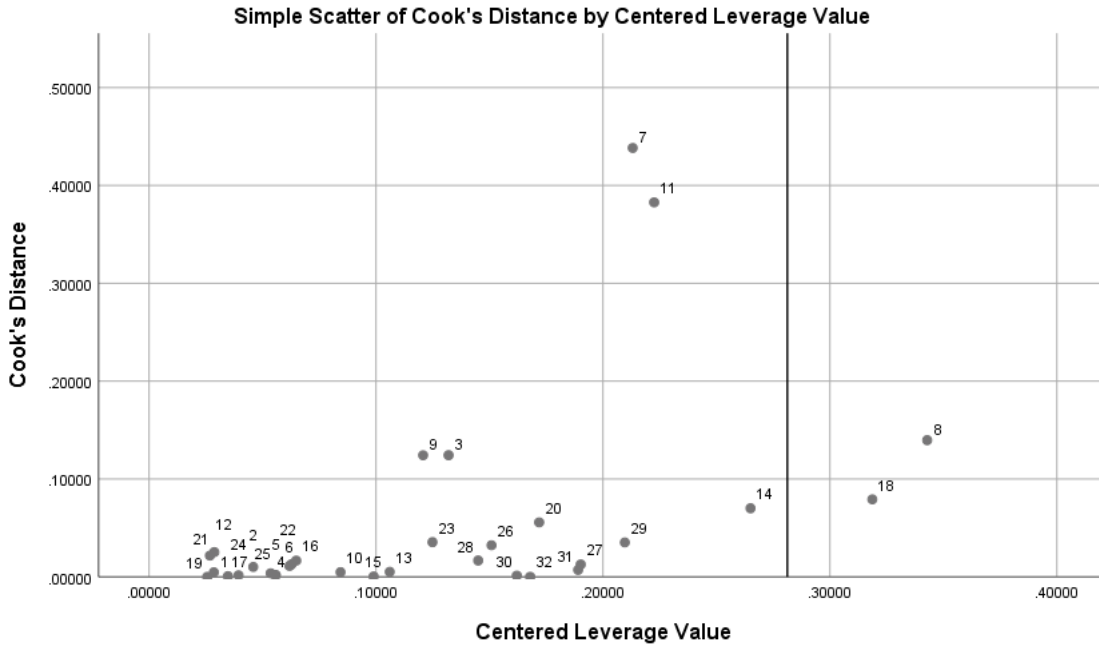


Figure 92: MBEA through Respect and Proactivity to IWB, Outlier Cook's D / Centered Leverage

Cases 7 and 11 might be outliers (Figure 93).

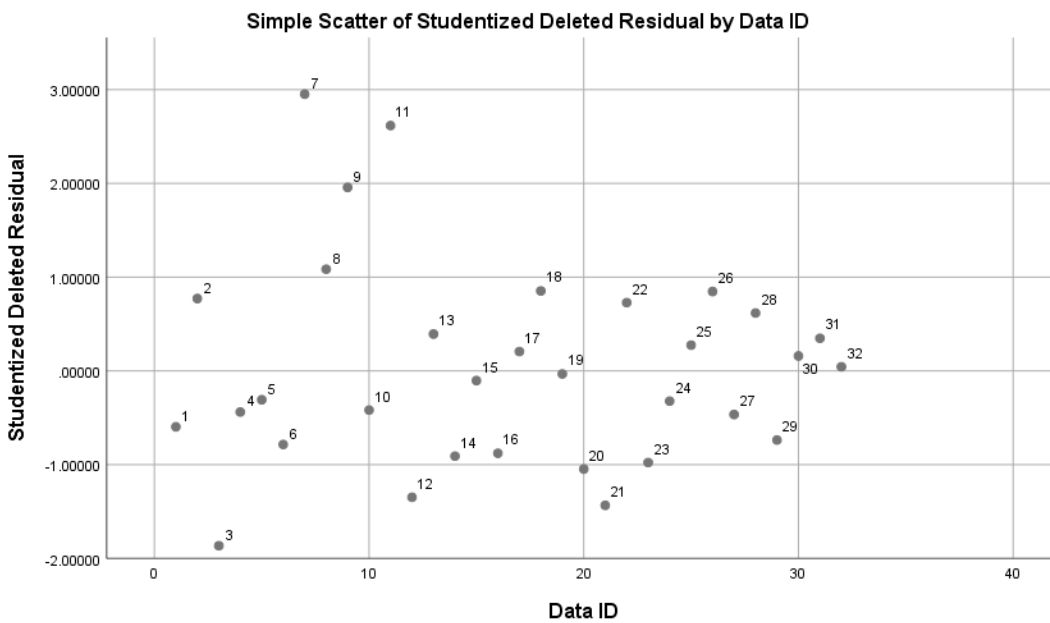


Figure 93: MBEA through Respect and Proactivity to IWB, Outlier Externally Studentized residuals

Cases 7 and 11 were identified two times as potential outliers. Both cases were excluded from the following mediation analysis.

MBEA through Respect and Proactivity to Innovation Work Behavior - Assumption Analysis.

Normality of Innovation Work Behavior.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 94 to 97) it could be observed that the values fell within a band of -2 to 2 on the Y-axis with one exception. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

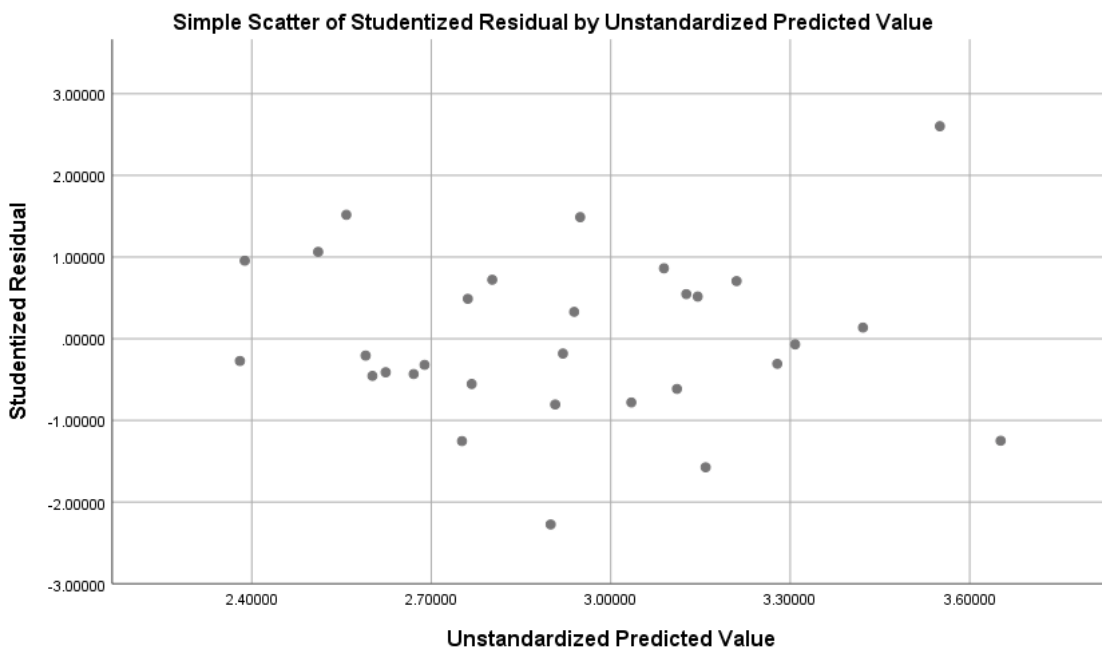


Figure 94: MBEA through Respect and Proactivity to IWB – Independence Plot 1

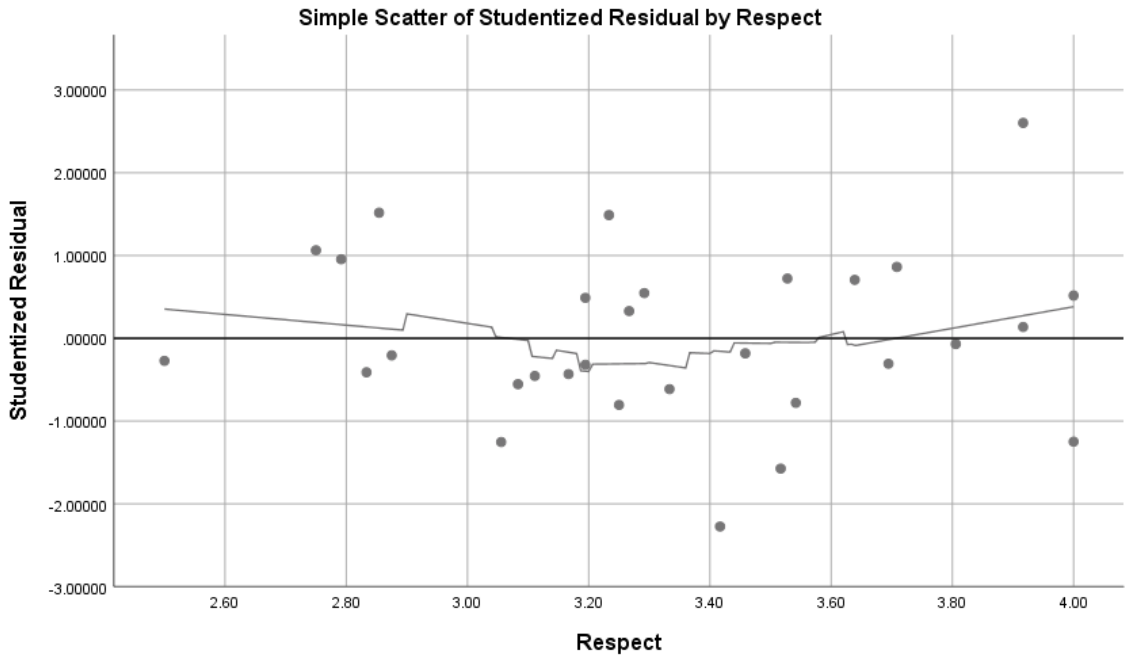


Figure 95: MBEA through Respect and Proactivity to IWB – Independence Plot 2

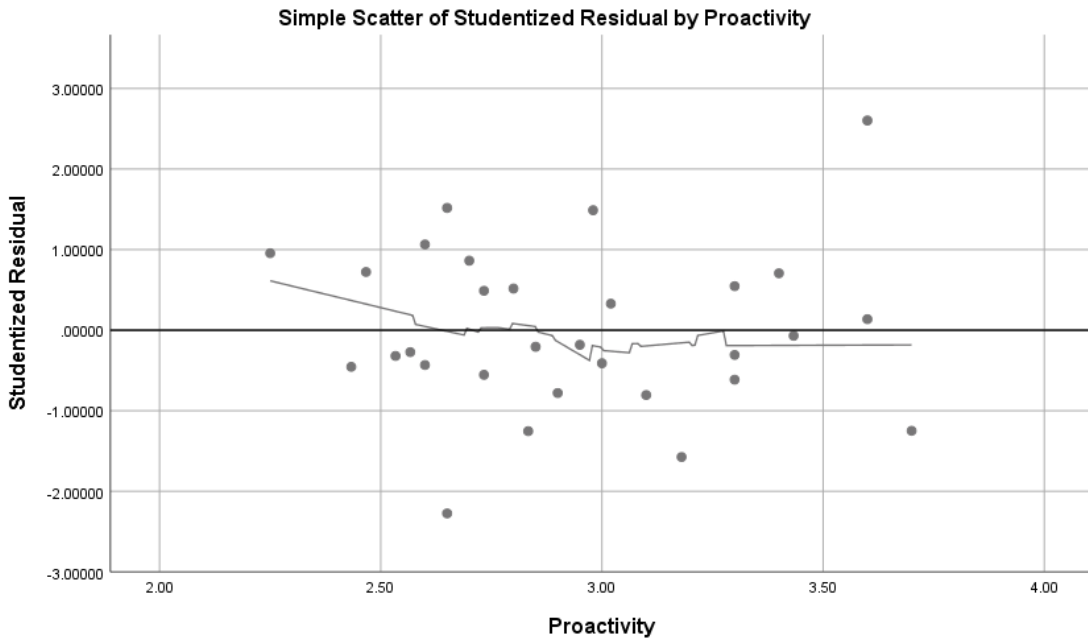


Figure 96: MBEA through Respect and Proactivity to IWB – Independence Plot 3

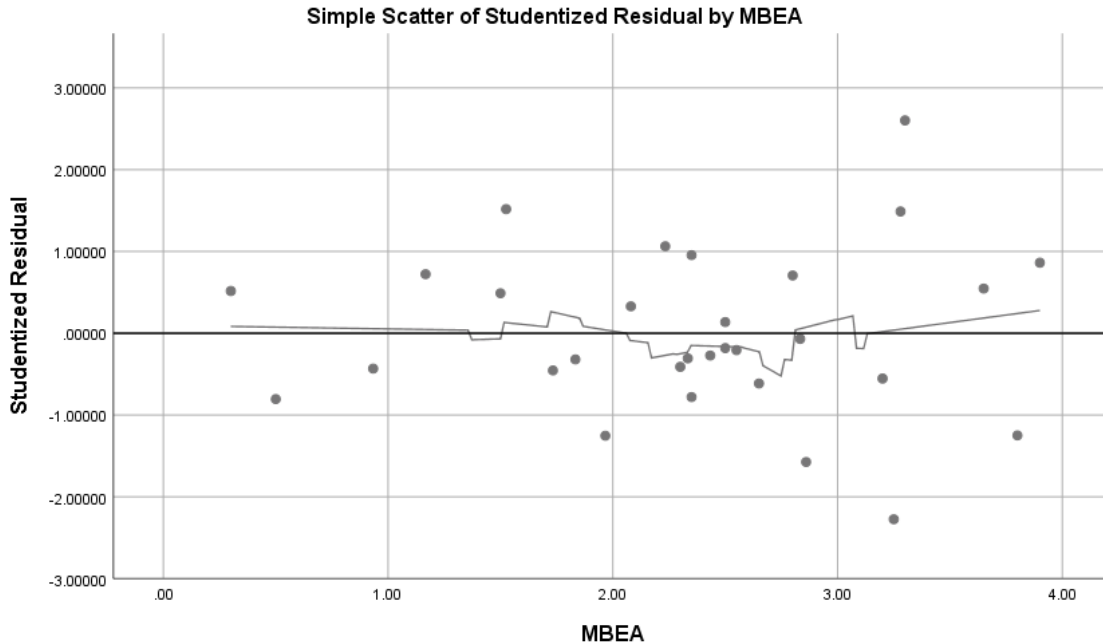


Figure 97: MBEA through Respect and Proactivity to IWB – Independence Plot 4

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 94 to 97) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 98) were produced between all independent and dependent variables. Only linear and random patterns were observable. Verifying above

independence plots, linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

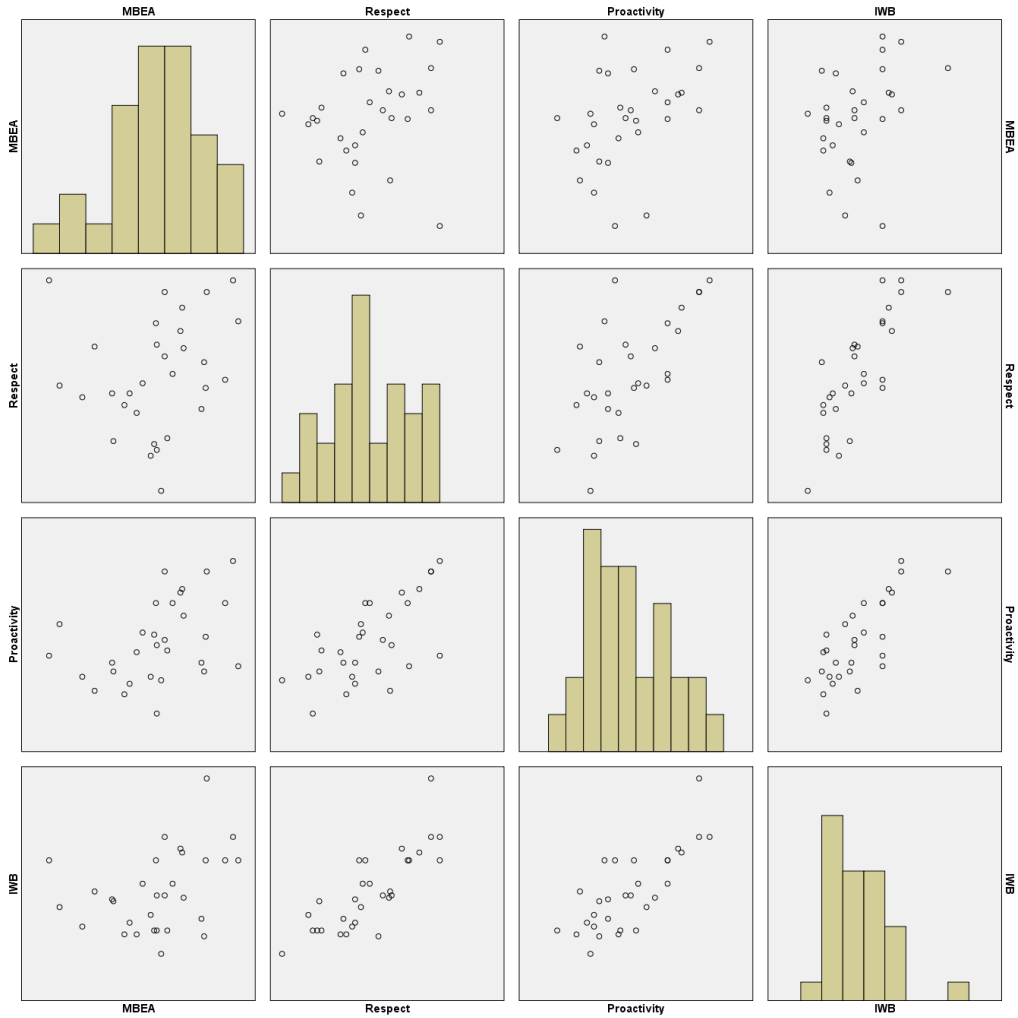


Figure 98: MBEA through Respect and Proactivity to IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q Plot (Figure 99) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

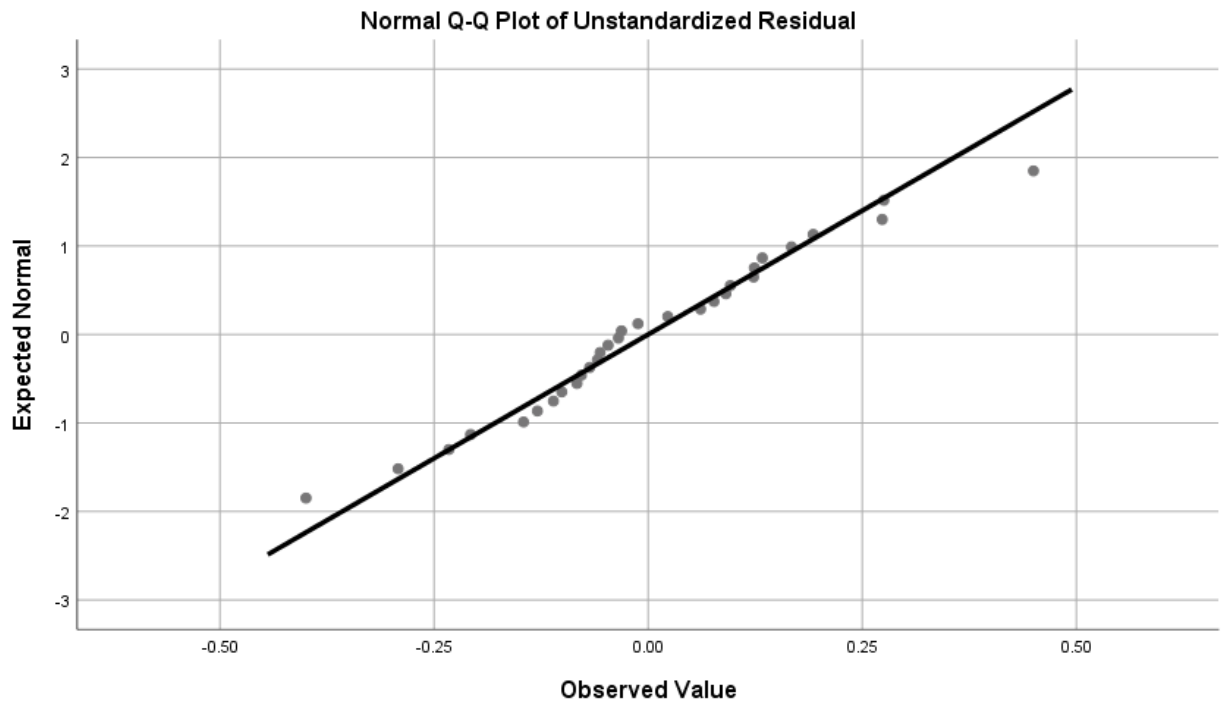


Figure 99: MBEA through Respect and Proactivity to IWB – Normality Q-Q Plot

The skewness and kurtosis (Table 38) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error
Unstandardized Residual	Mean	.000	.032
	95% Confidence Interval for Mean	Lower Bound	-.066
		Upper Bound	.066
	5% Trimmed Mean	-.001	
	Median	-.032	
	Variance	.032	

Std. Deviation	.178	
Minimum	-.399	
Maximum	.449	
Range	.849	
Interquartile Range	.226	
Skewness	.214	.427
Kurtosis	.585	.833

Table 38: MBEA through Respect and Proactivity to IWB – Normality Descriptive Statistics

The histogram (Figure 100) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

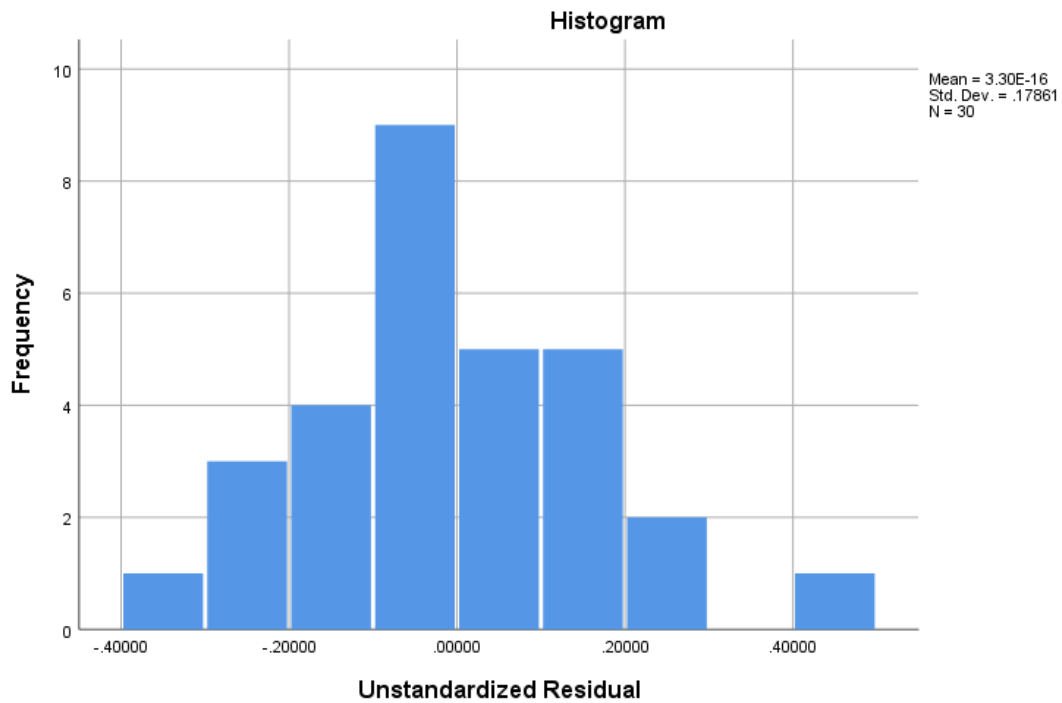


Figure 100: MBEA through Respect and Proactivity to IWB – Normality Histogram

The box plot (Figure 101) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

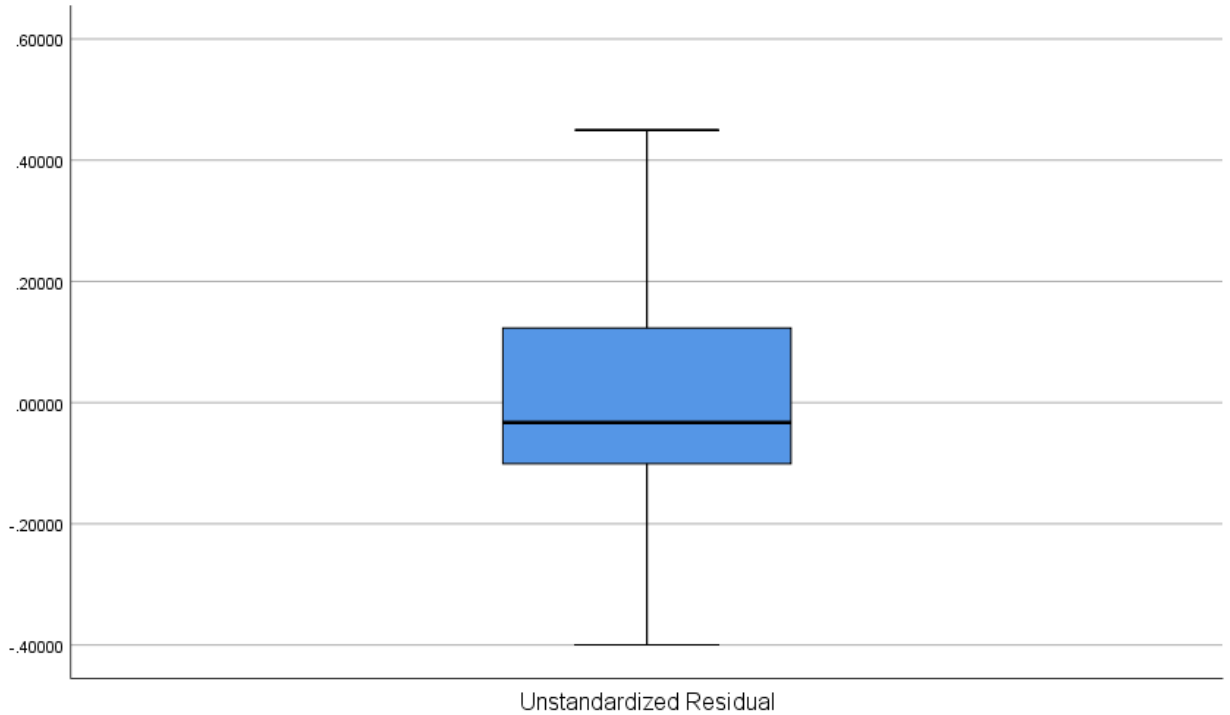


Figure 101: MBEA through Respect and Proactivity to IWB – Normality Boxplot

Both tests of normality (Table 39) provided non-significant tests results

supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.102	30	.200*	.986	30	.948

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 39: MBEA through Respect and Proactivity to IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 40) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

		Tolerance	VIF
1	(Constant)		
	MBEA	.813	1.230
	Respect	.559	1.790
	Proactivity	.428	2.334
	group	.850	1.177

Table 40: MBEA through Respect and Proactivity to IWB – Multicollinearity VIF

Only the eigenvalue (Table 41) of Proactivity was close to 0. The Group variable is nominal and not relevant. A regression between Proactivity and the other independent variables produced an R^2 of .572 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	4.821
	2	.100
	3	.066
	4	.008
	5	.004

Table 41: MBEA through Respect and Proactivity to IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Double Mediation model – MBEP through Respect and Proactivity to Innovation Work Behavior.

MBEP through Respect and Proactivity to Innovation Work Behavior – Outlier Analysis.

The centered leverage value (Figure 102) cut-off value was 0.28125 calculated as described in Chapter 3. Case 7 and 20 might be outliers. But case 11 required attention due to its Cook's D value.

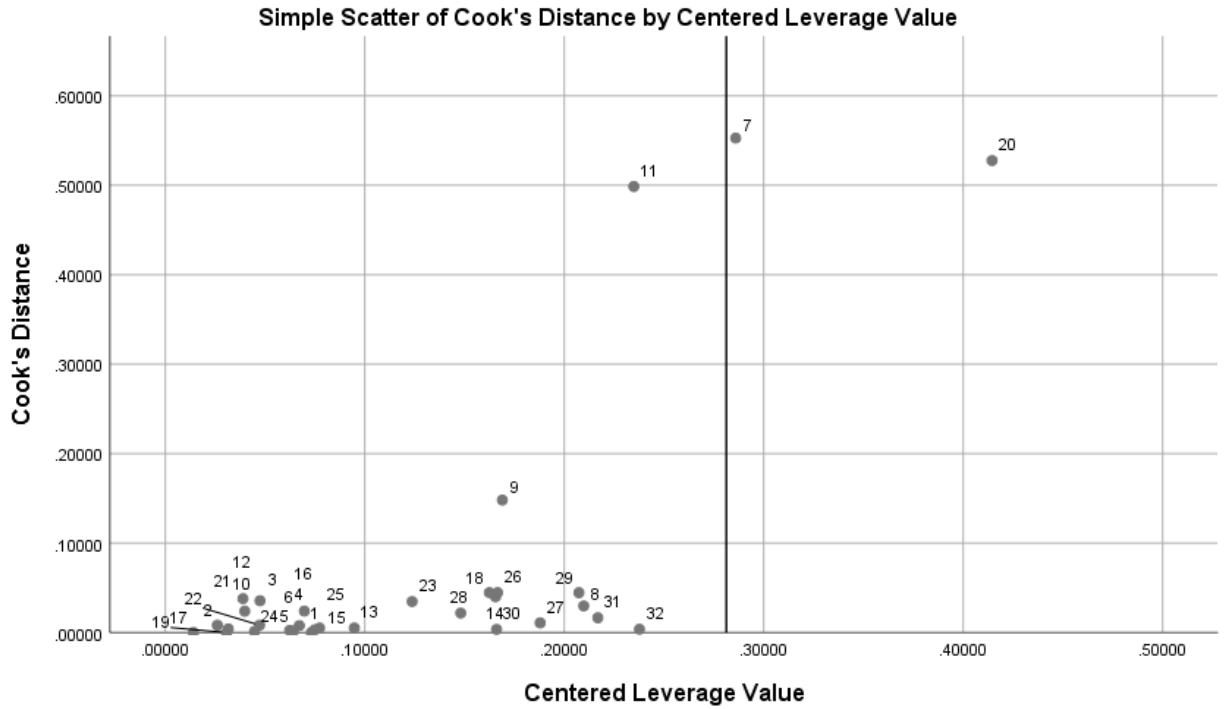


Figure 102: MBEP through Respect and Proactivity to IWB, Outlier Cook's D / Centered Leverage

Cases 7 and 11 might be outliers (Figure 103).

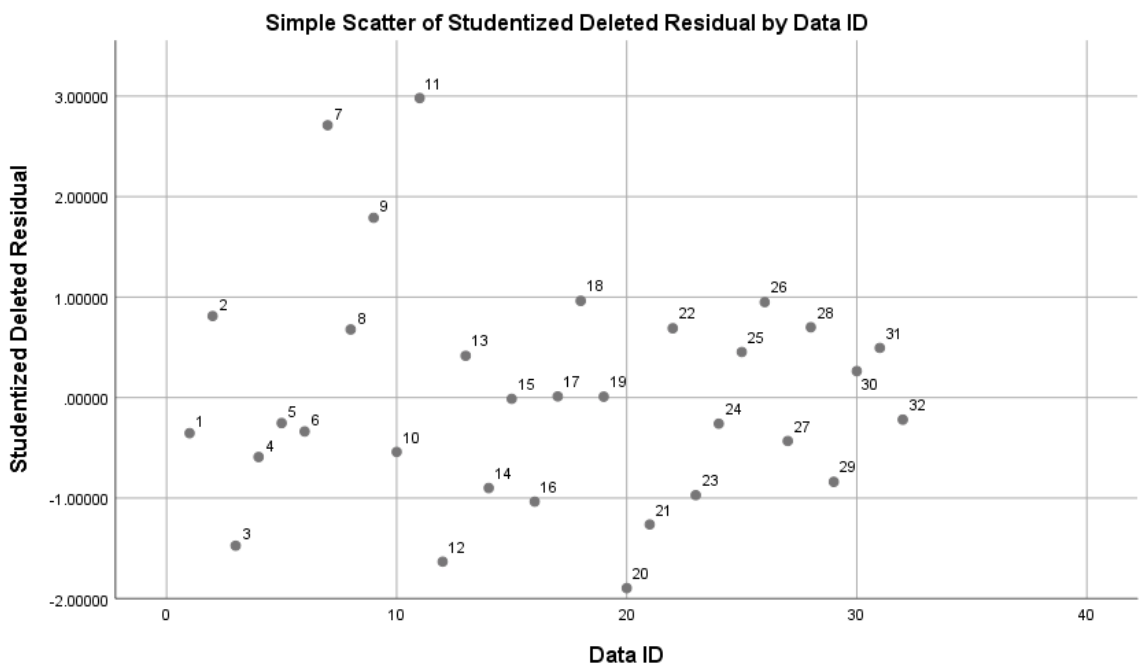


Figure 103: MBEP through Respect and Proactivity to IWB, Outlier Externally Studentized residuals

Cases 7 was identified three times as potential outliers and was excluded from the following mediation analysis.

MBEP through Respect and Proactivity to Innovation Work Behavior - Assumption Analysis.

Normality of Innovation Work Behavior.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 104 to 107), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with one exception. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

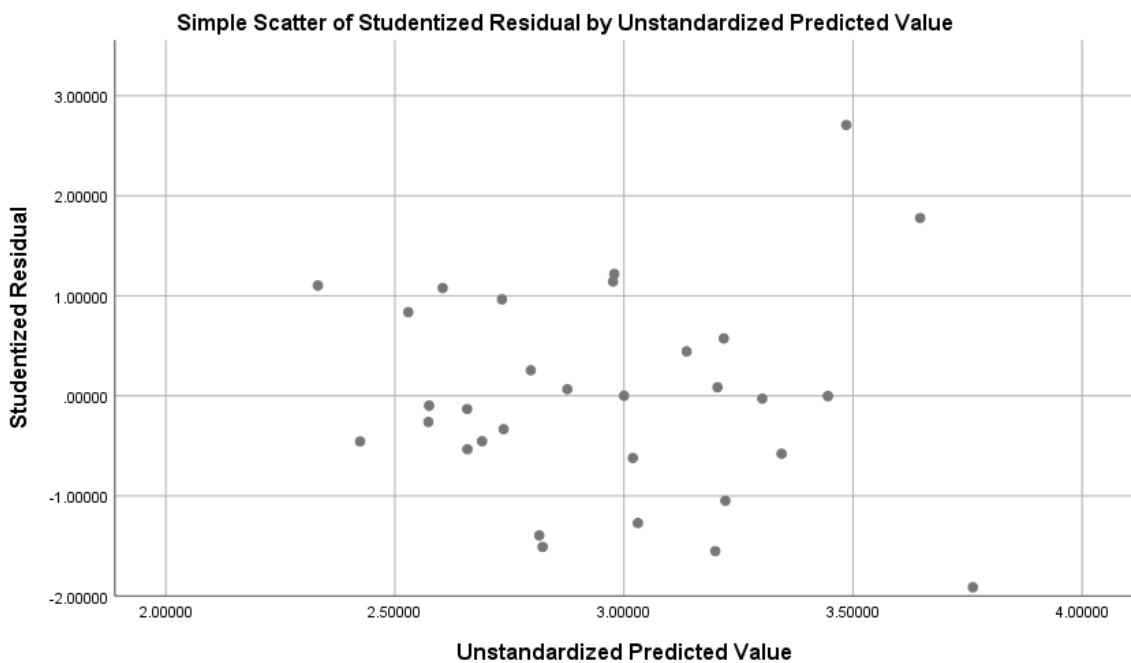


Figure 104: MBEP through Respect and Proactivity to IWB – Independence Plot 1

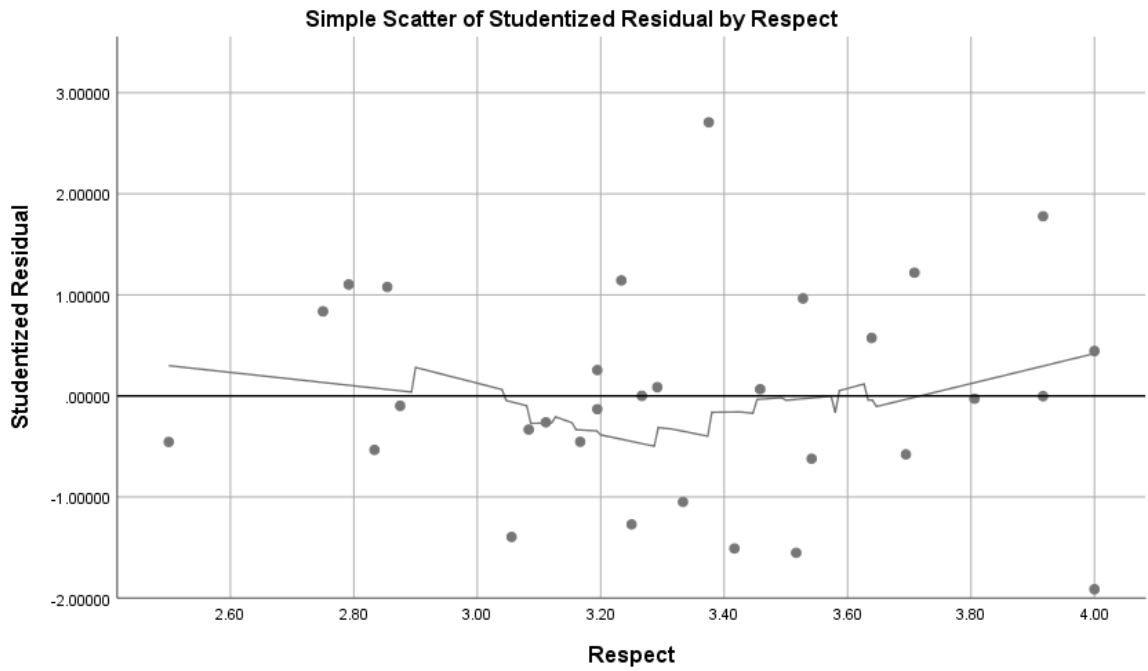


Figure 105: MBEP through Respect and Proactivity to IWB – Independence Plot 2

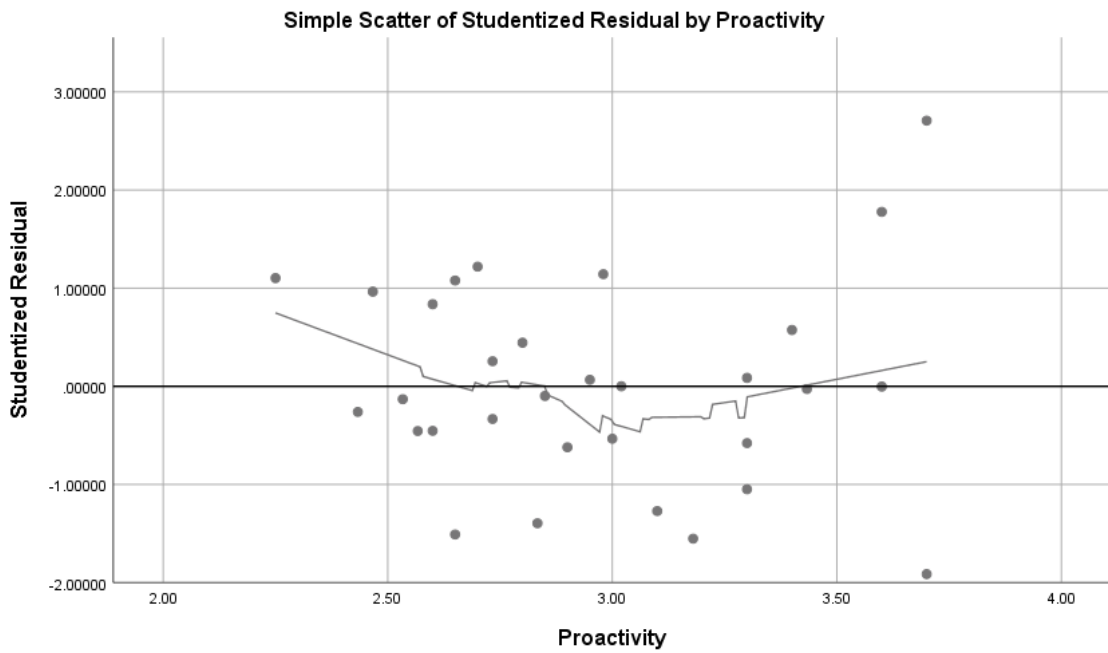


Figure 106: MBEP through Respect and Proactivity to IWB – Independence Plot 3

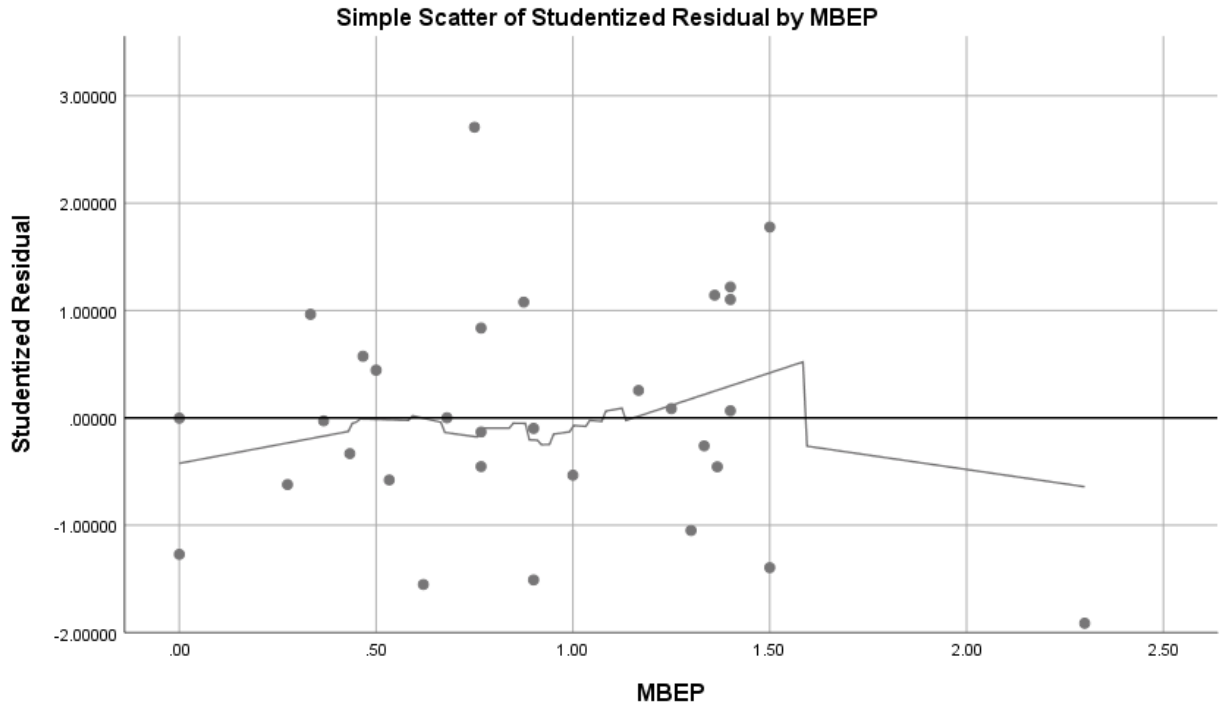


Figure 107: MBEP through Respect and Proactivity to IWB – Independence Plot 4

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 104 to 107) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 108) were produced between all independent and dependent variables. Only linear and random patterns were observable. Verifying above

independence plots, linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

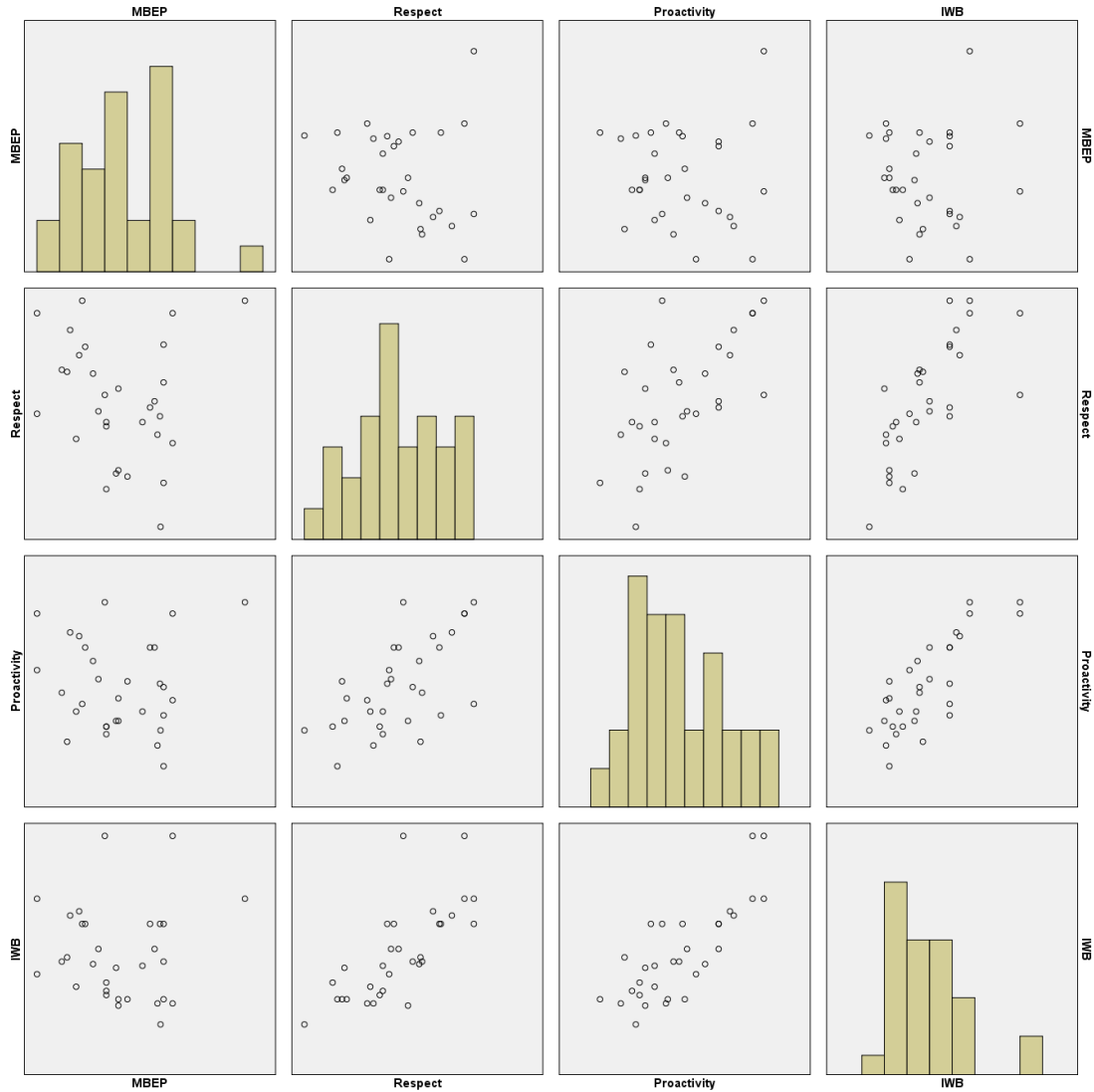


Figure 108: MBEP through Respect and Proactivity to IWB – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q plot (Figure 109) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

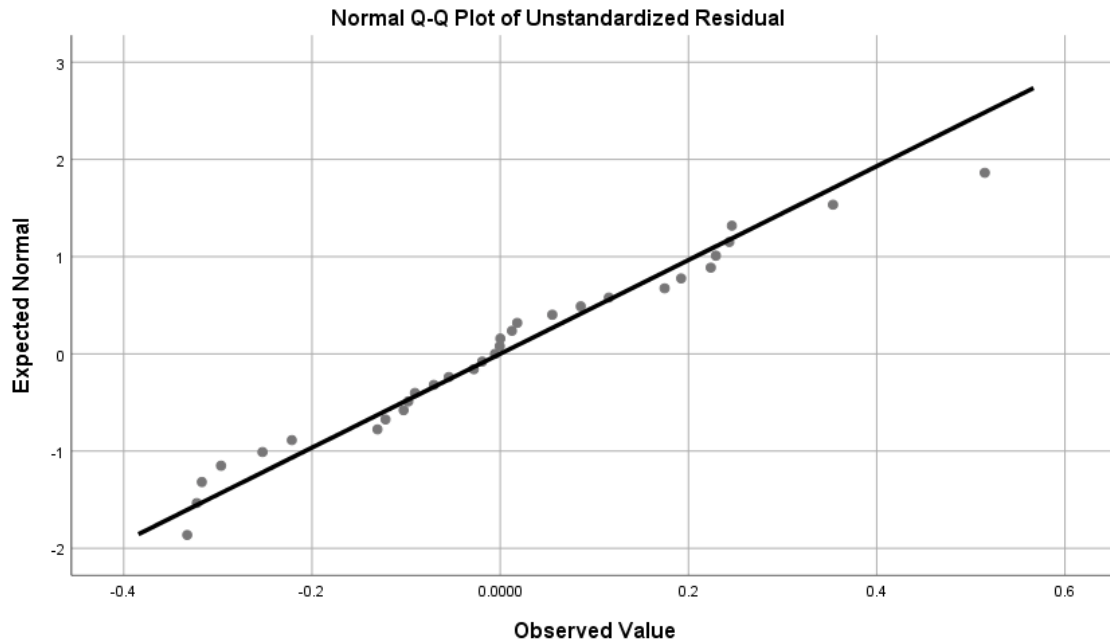


Figure 109: MBEP through Respect and Proactivity to IWB – Normality Q-Q Plot

The skewness and kurtosis (Table 42) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.037	
	95% Confidence Interval for Mean	Lower Bound	-.076	
		Upper Bound	.076	
	5% Trimmed Mean	-.007		
	Median	-.005		
	Variance	.043		
	Std. Deviation	.207		
	Minimum	-.332		

Maximum	.514	
Range	.847	
Interquartile Range	.296	
Skewness	.342	.421
Kurtosis	-.039	.821

Table 42: MBEP through Respect and Proactivity to IWB – Normality Descriptive Statistics

The histogram (Figure 109) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

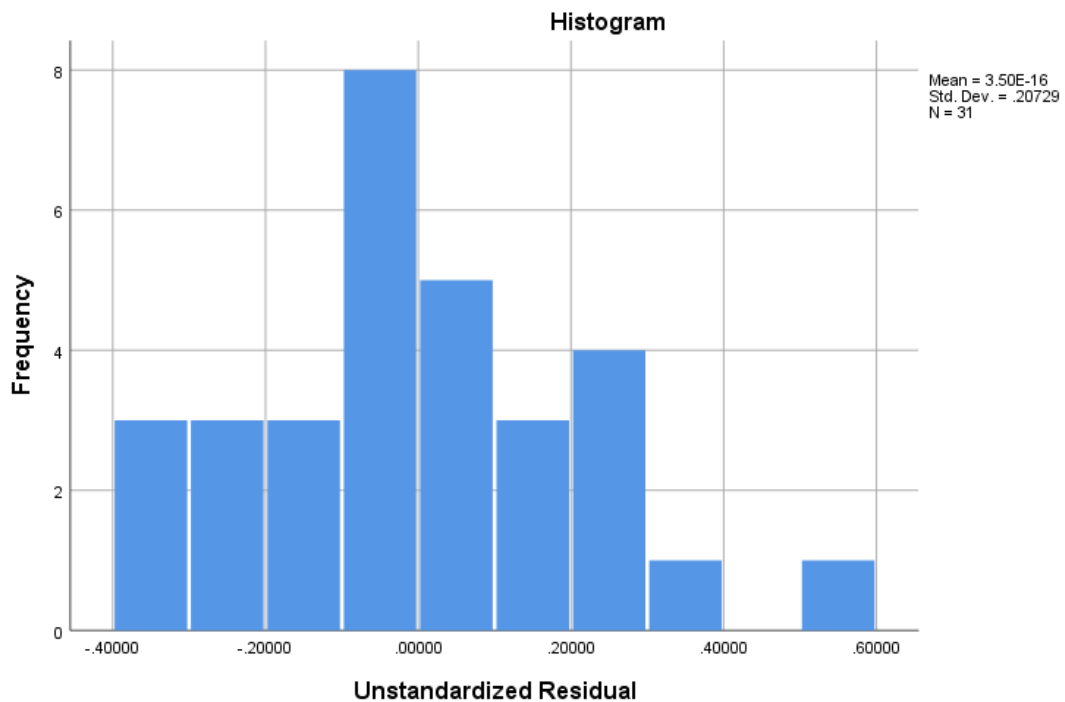


Figure 110: MBEP through Respect and Proactivity to IWB – Normality Histogram

The box plot (Figure 111) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

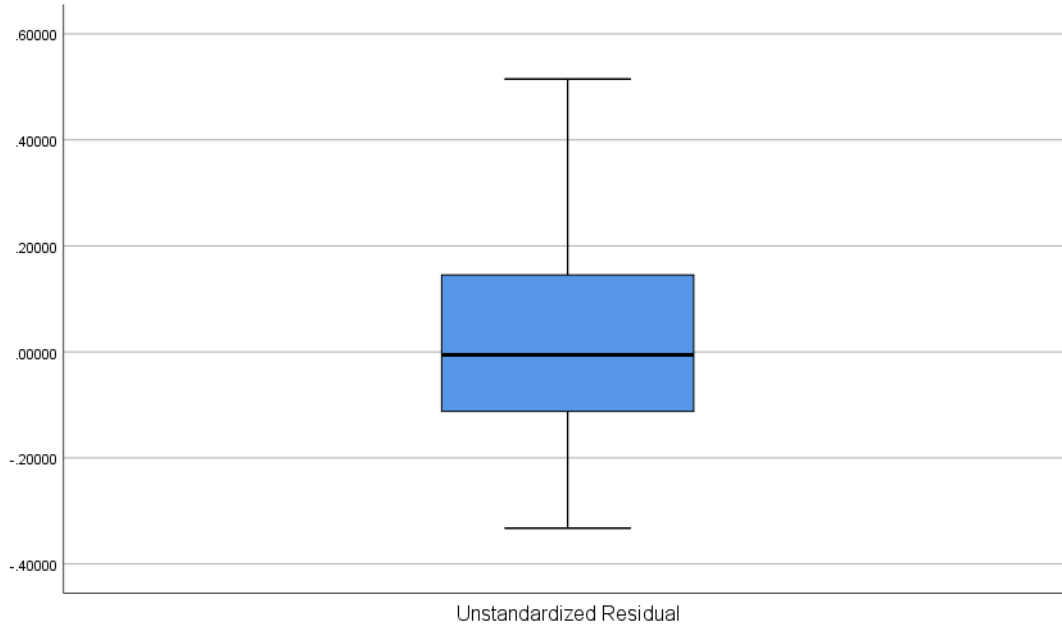


Figure 111: MBEP through Respect and Proactivity to IWB – Normality Boxplot

Both tests of normality (Table 43) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.110	31	.200*	.969	31	.488

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 43: MBEP through Respect and Proactivity to IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 44) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

		Tolerance	VIF
1	(Constant)		
	MBEP	.923	1.083
	Respect	.598	1.672
	Proactivity	.557	1.796
	group	.851	1.175

Table 44: MBEP through Respect and Proactivity to IWB – Multicollinearity VIF

Only the eigenvalue (Table 45) of Proactivity was close to 0. The Group variable was nominal and not relevant. A regression between Proactivity and the other independent variables produced an R^2 of .443 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	4.696
	2	.229
	3	.061
	4	.008
	5	.005

Table 45: MBEP through Respect and Proactivity to IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Double Mediation model – LF through Respect and Proactivity to Innovation Work Behavior.

LF through Respect and Proactivity to Innovation Work Behavior - Outlier Analysis.

The centered leverage value (Figure 112) cut-off value was 0.28125 calculated as described in Chapter 3. Case 7 might be an outlier. But case 11 required attention due to its Cook's D value.

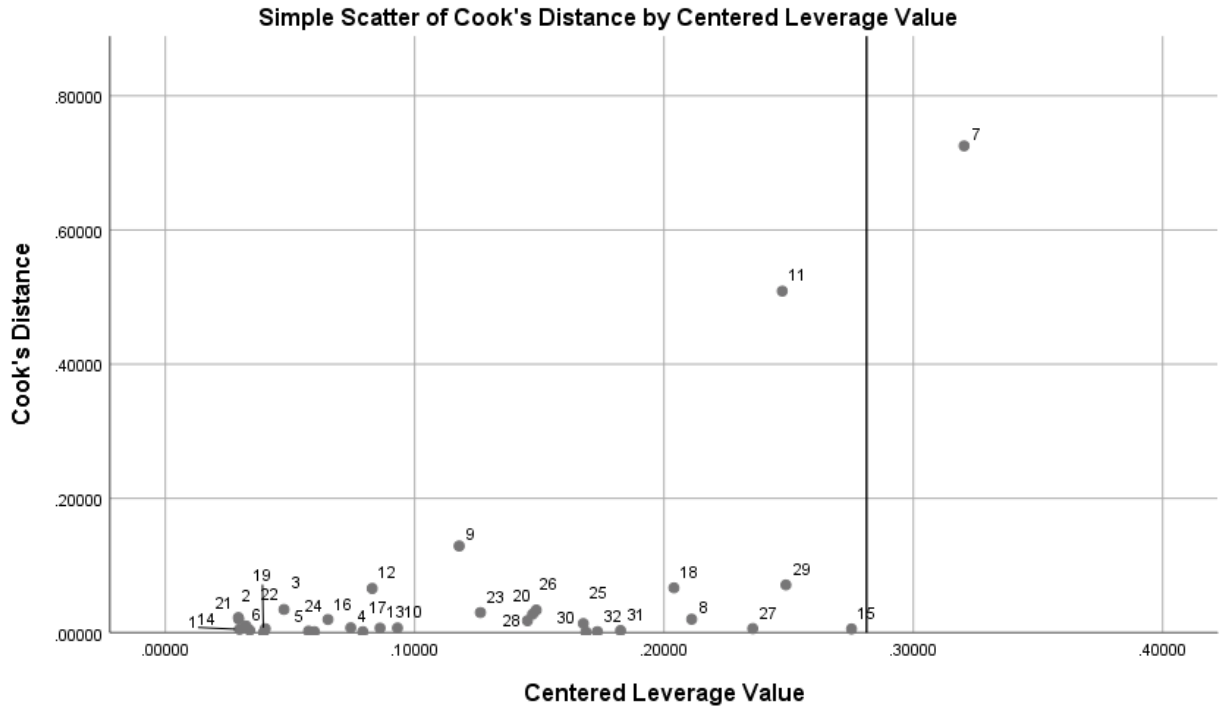


Figure 112: LF through Respect and Proactivity to IWB, Outlier Cook's D / Centered Leverage

Cases 7 and 11 might be outliers (Figure 113).

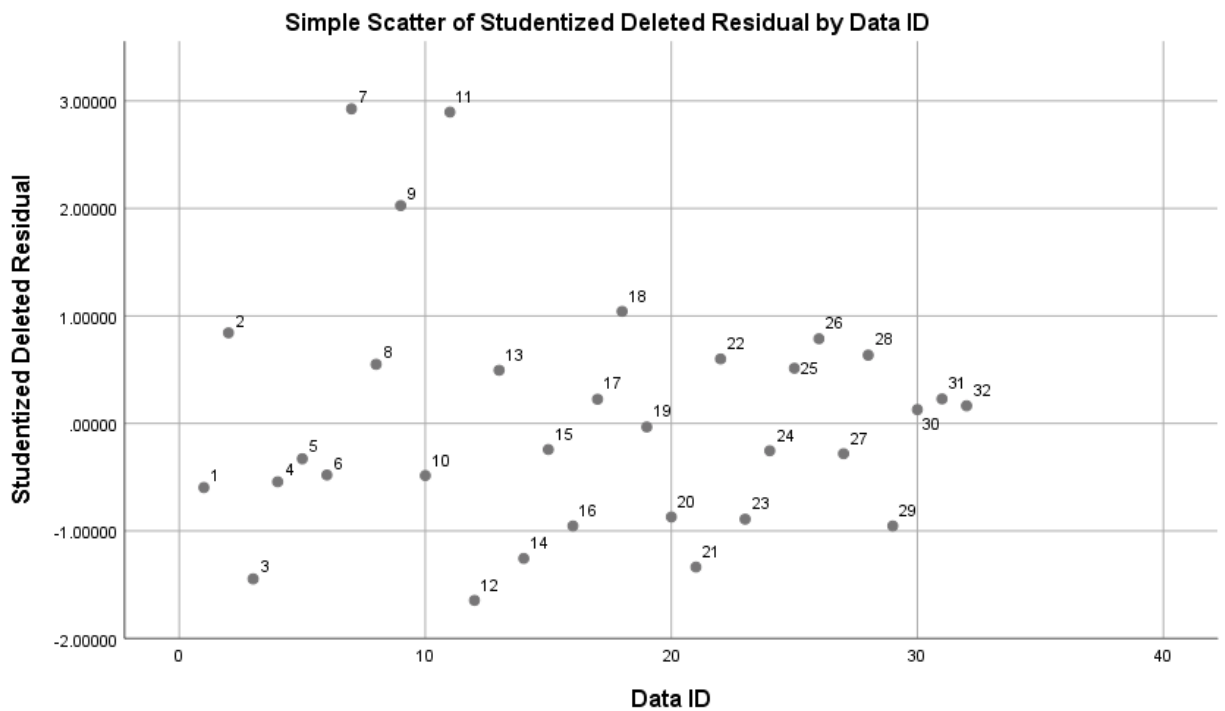


Figure 113: LF through Respect and Proactivity to IWB, Outlier Externally Studentized residuals

Cases 7 was identified three times as potential outliers and was excluded from the following mediation analysis.

LF through Respect and Proactivity to Innovation Work Behavior - Assumption Analysis.

Normality of Innovation Work Behavior.

The normality assumption was reasonably fulfilled earlier (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Independence.

In all independence plots (Figures 114 to 117), it could be observed that the values fell within a band of -2 to 2 on the Y-axis with one exception. The points did not follow a pattern (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

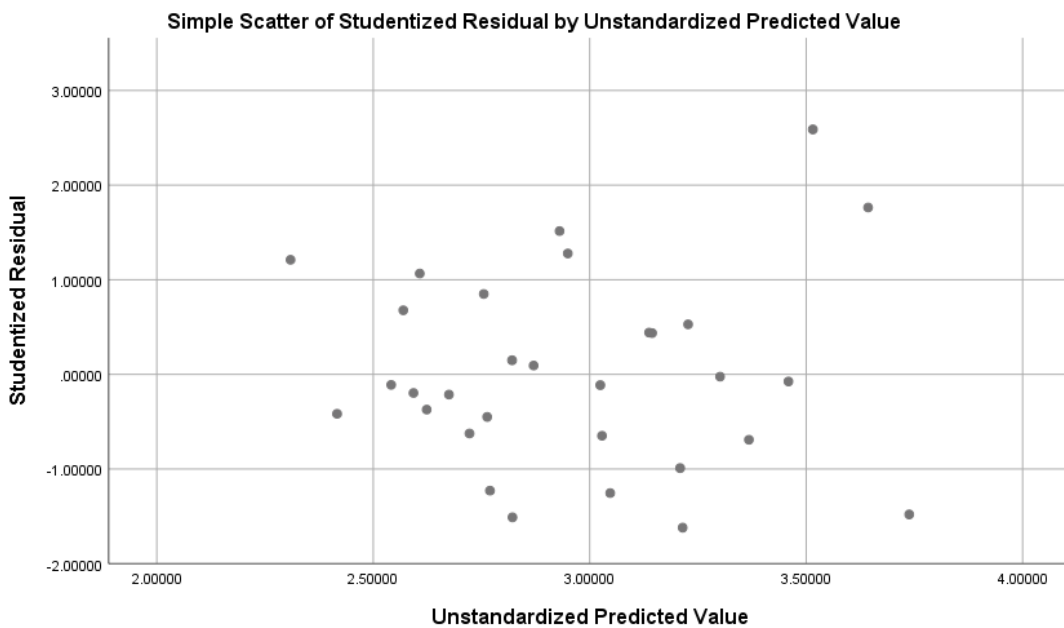


Figure 114: LF through Respect and Proactivity to IWB – Independence Plot 1

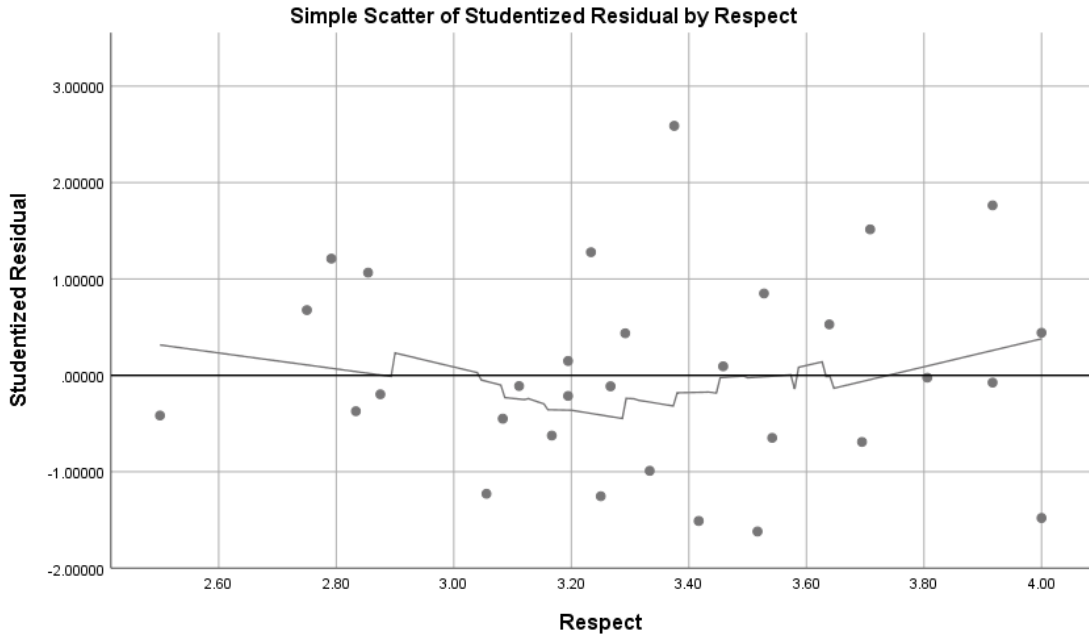


Figure 115: LF through Respect and Proactivity to IWB – Independence Plot 2

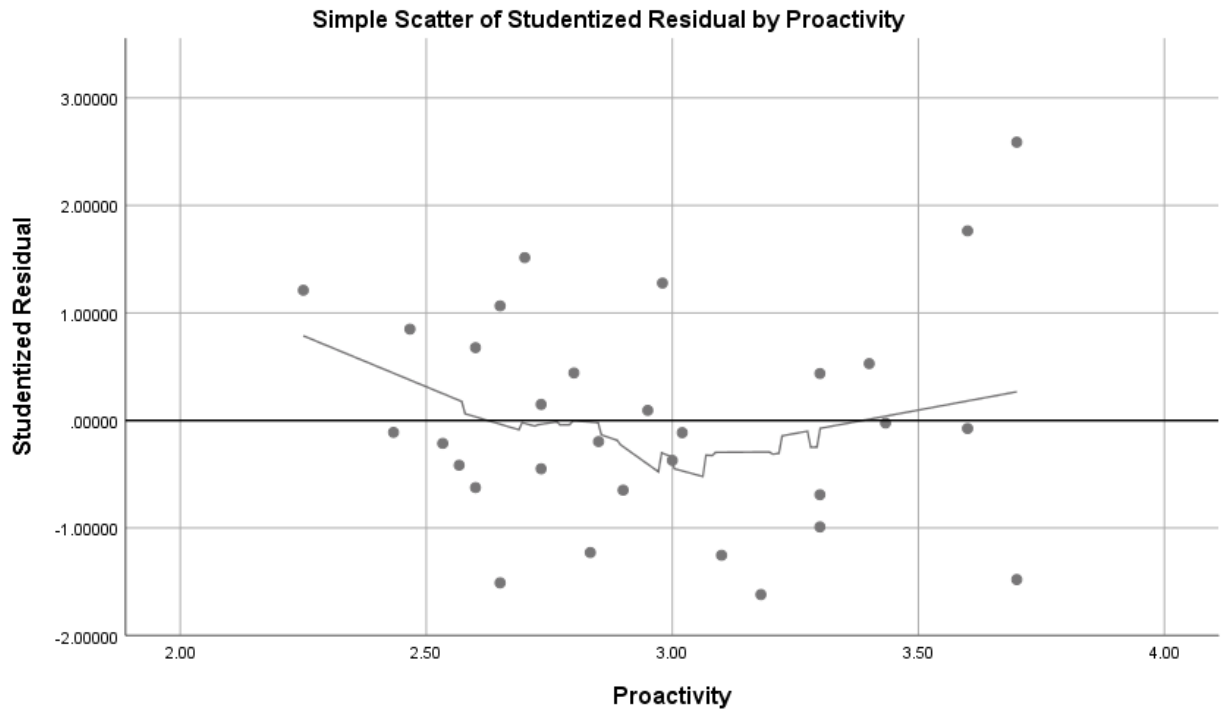


Figure 116: LF through Respect and Proactivity to IWB – Independence Plot 3

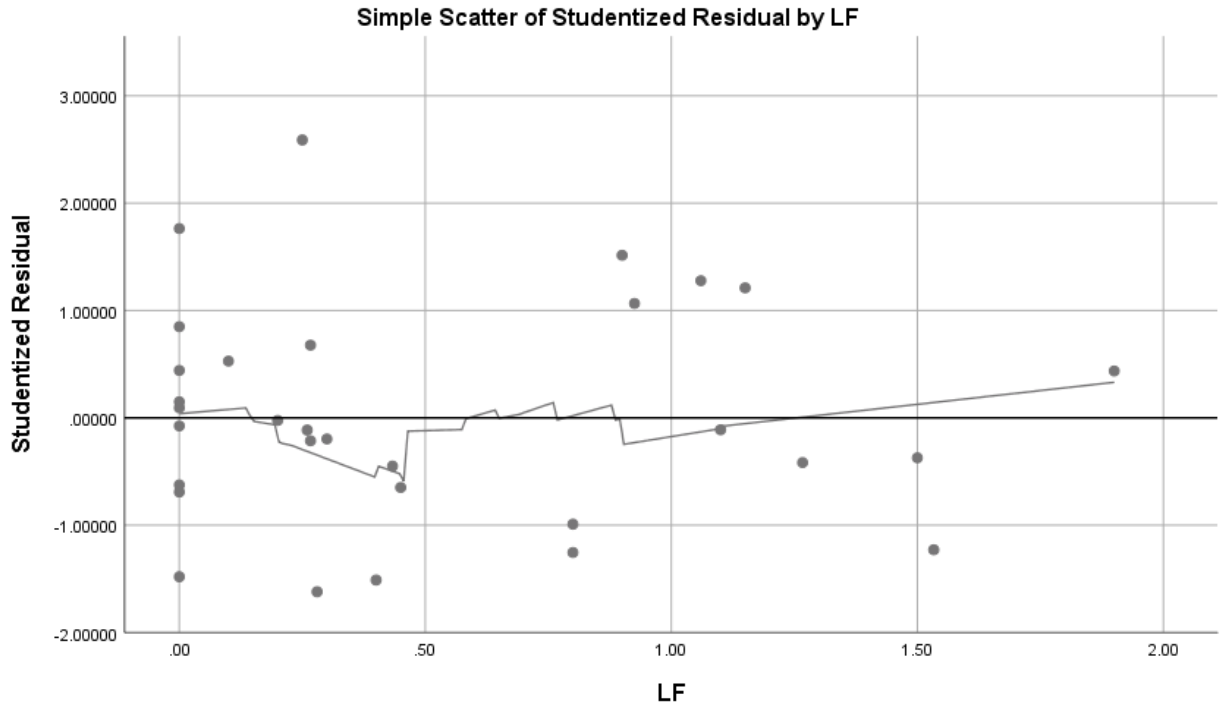


Figure 117: LF through Respect and Proactivity to IWB – Independence Plot 4

Considering all evidence from above, the independence assumption was reasonably fulfilled.

Homogeneity of Variance.

The spreads of the studentized residuals over the range of unstandardized predicted values and over all independent variables were fairly constant (Figures 114 to 117) (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Considering this evidence, the homoscedasticity assumption was reasonably fulfilled.

Linearity.

Multiple scatterplots (Figure 118) were produced between all independent and dependent variables. Only linear and random patterns were observable. Verifying above

independence plots, linear patterns were supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

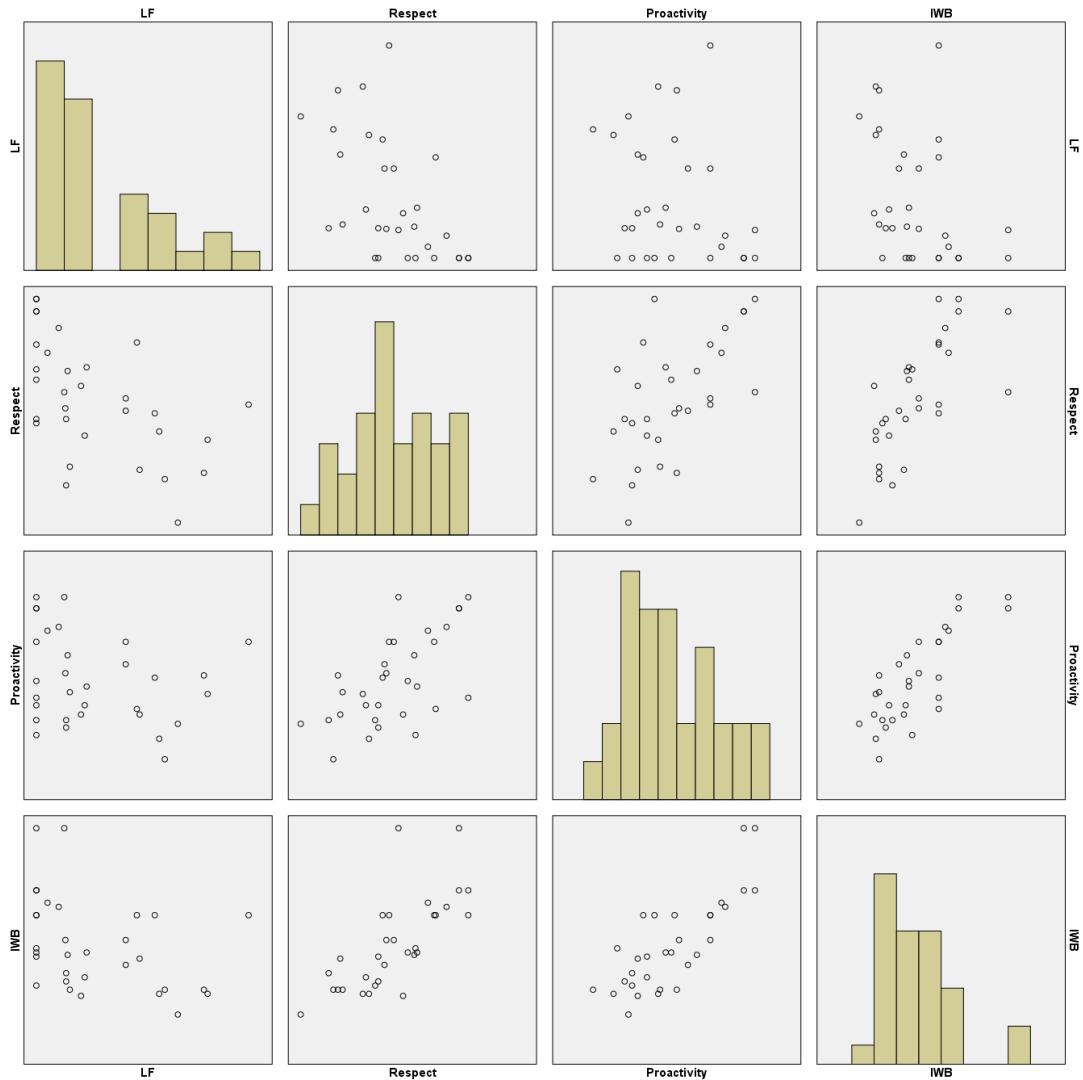


Figure 118: LF through Respect and Proactivity to Innovation Work Behavior – Linearity

Considering all evidence from above, the linearity assumption was reasonably fulfilled.

Normality.

The observed values in the normal Q-Q plot (Figure 119) followed the line in an acceptable manner suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

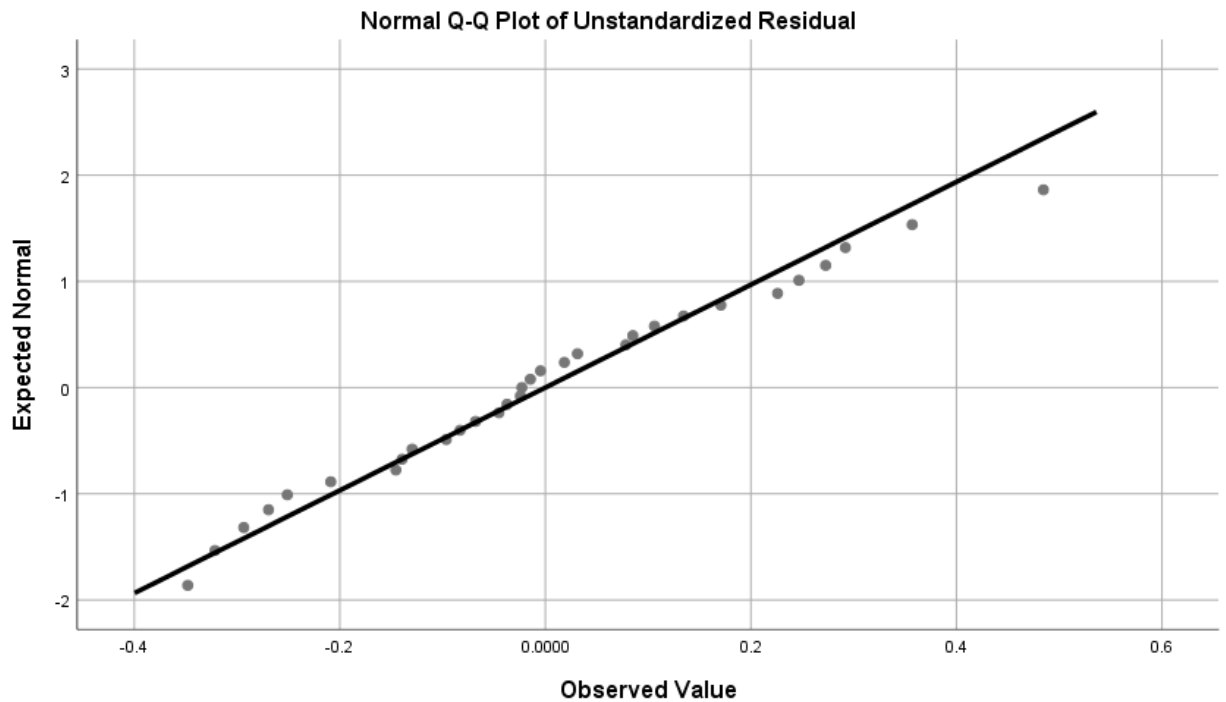


Figure 119: LF through Respect and Proactivity to Innovation Work Behavior – Normality Q-Q Plot

The skewness and kurtosis (Table 46) were within the range of absolute value 2.0 suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012).

Descriptive Statistic

		Statistic	Std. Error	
Unstandardized Residual	Mean	.000	.037	
	95% Confidence Interval for Mean	Lower Bound	-.075	
		Upper Bound	.075	
	5% Trimmed Mean	-.005		
	Median	-.022		
	Variance	.043		
	Std. Deviation	.206		

Minimum	-0.347	
Maximum	.484	
Range	.832	
Interquartile Range	.273	
Skewness	.347	.421
Kurtosis	-.258	.821

Table 46: LF through Respect and Proactivity to IWB – Normality Descriptive Statistics

The histogram (Figure 120) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

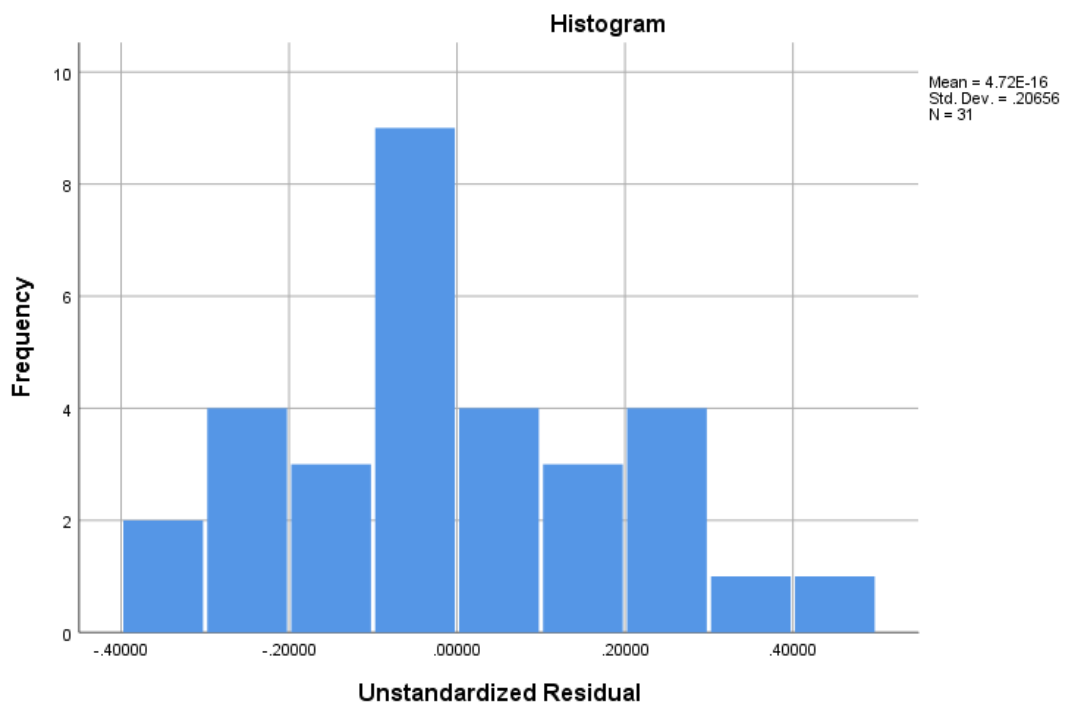


Figure 120: LF through Respect and Proactivity to Innovation Work Behavior – Normality Histogram

The boxplot (Figure 121) reflected an acceptable normal distribution suggesting evidence of normality (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

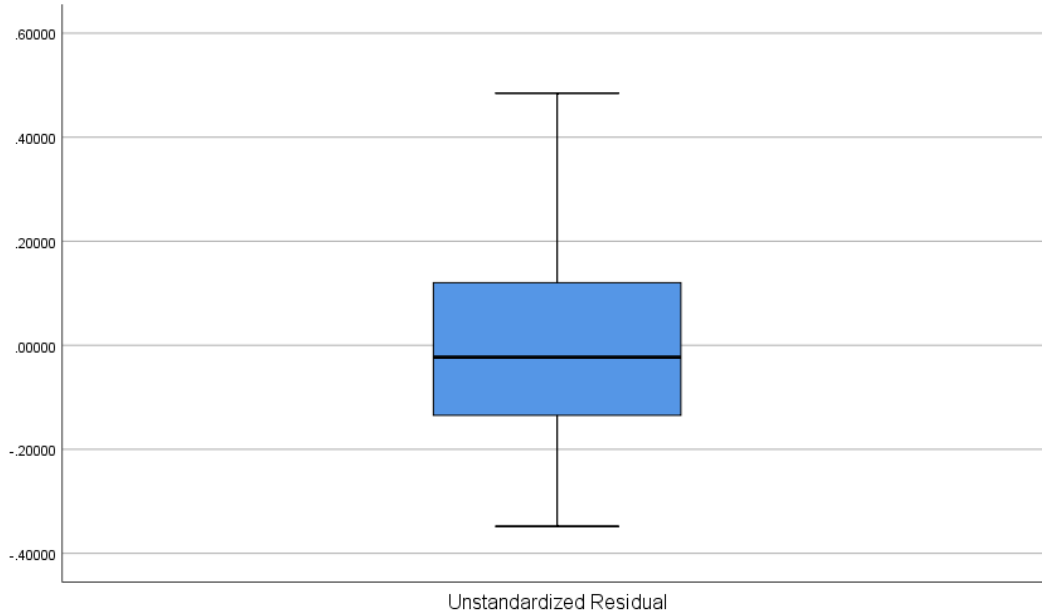


Figure 121: LF through Respect and Proactivity to Innovation Work Behavior – Normality Boxplot

Both tests of normality (Table 47) provided non-significant tests results supporting the normality assumption (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Unstandardized Residual	.090	31	.200*	.979	31	.777

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 47: MBEA through Respect and Proactivity to IWB – Normality Test

Considering all evidence from above, the normality assumption was reasonably fulfilled.

Multicollinearity.

The VIF (Table 48) was below 10 suggesting no multicollinearity was present (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	LF	.660	1.515
	Respect	.438	2.285
	Proactivity	.549	1.820
	group	.877	1.140

Table 48: MBEA through Respect and Proactivity to Innovation Work Behavior – Multicollinearity VIF

Only the eigenvalue (Table 49) of Proactivity is close to 0. The Group variable was nominal and not relevant. A regression between Proactivity and the other independent variables produced an R^2 of .451 and thus below the threshold of .9. No multicollinearity was supported (Lomax & Hahs-Vaughn, 2012; Cohen et al., 2013).

Model	Dimension	Eigenvalue
1	1	4.419
	2	.499
	3	.070
	4	.008
	5	.004

Table 49: MBEA through Respect and Proactivity to IWB – Multicollinearity Eigenvalue

Considering all evidence from above, the no multicollinearity assumption was reasonably fulfilled.

Summary all Regression Models – Outlier and Assumptions.

Regression Model	Outlier Analysis	Assumptions
LS -> Respect	Case 8 might be an outlier	All regression assumptions are reasonably met
LS -> Proactivity	No outliers	All regression assumptions are reasonably met
LS -> IWB	Cases 8 and 11 might be outliers	Regression assumptions are reasonably met, but normality assumption was challenged. However, multicollinearity between CR and TL existed. For the regression CR respectively TL were excluded.
TL -> Respect -> Proactivity	No outliers	All regression assumptions are met
TL -> Respect -> IWB	Cases 9 and 11 might be outliers	All regression assumptions are met
TL -> Respect -> Proactivity-> IWB	Cases 7 and 11 might be outliers	All regression assumptions are met
CR -> Respect -> Proactivity-> IWB	Cases 7 and 11 might be outliers	All regression assumptions are met
MBEA -> Respect -> Proactivity-> IWB	Cases 7 and 11 might be outliers	All regression assumptions are met
MBEP -> Respect -> Proactivity-> IWB	Case 7 might be an outlier	All regression assumptions are met
LF -> Respect -> Proactivity-> IWB	Case 7 might be an outlier	All regression assumptions are met

Table 50: Summary all Regression Models

Reliability of Scales

Cronbach's alpha for Respect was 0.923, thus excellent

Cronbach's alpha for Proactivity was 0.834, thus good.

Cronbach's alpha for Innovative Work Behavior was 0.861, thus good.

Multiple Regression Models – Results

The results of three multiple regression models are now presented. 1. Leadership Styles with Respect, 2. Leadership Styles with Proactivity, and 3. Leadership Styles with Innovative Work Behavior.

LS and Respect.

As explained in chapter 3, the basic multiple regression model tested was

$$Respect = \beta_{Respect_j} Leadership Style_{j_i} + \alpha_{Respect Leadership Style} + \varepsilon_i$$

The tested statistical hypothesis were

H₁₀: There is no statistically significant relationship between the leadership style and respect.

H_{1a}: There is a statistically significant relationship between the leadership style and respect.

Table 51 provides the corresponding correlation data and table 52 the detailed coefficient data.

		Correlations						
		Respect	CR	MBEA	MBEP	LV	TL	group
Pearson	Respect	1.000	.765	.236	-.307	-.671	.840	.133
Correlation	CR	.765	1.000	.250	-.335	-.701	.915	.043
	MBEA	.236	.250	1.000	.379	.057	.268	.126
	MBEP	-.307	-.335	.379	1.000	.470	-.300	-.250
	LV	-.671	-.701	.057	.470	1.000	-.718	-.181
	TL	.840	.915	.268	-.300	-.718	1.000	.057
	group	.133	.043	.126	-.250	-.181	.057	1.000

Table 51: Correlations – LS on Respect

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.956	.434		4.502	.000
	CR	-.050	.172	-.080	-.292	.773
	MBEA	.034	.068	.070	.496	.624
	MBEP	-.040	.115	-.050	-.346	.733
	LV	-.097	.119	-.145	-.818	.422
	TL	.499	.182	.773	2.735	.012
	group	.049	.130	.045	.379	.708

Table 52: Coefficients – LS on Respect

The results of the multiple linear regression suggested that a significant proportion of the total variation in Respect was predicted by TL, CR, MBEA, MBEP, LF, Group, $F(6,24) = 10.430$, $p \leq 0.000$. Additionally, I found the following:

1. For TL, the unstandardized partial slope (0.499) and standardized partial slope (.773) were statistically significant from 0 ($t = 2.735$), $df = 6$, $p < 0.012$; with every one-point increase in TL, Respect will increase by one-half of one point when controlling for the other independent variables.
2. For all other independent variables (CR, MBEA, MBEP, LF, Group), the partial slopes were not statistically significant.
3. The CI around the unstandardized partial slope of TL did not include 0 (TL, .123, .876), further confirming that this variable was a statistically significant predictor of Respect.
4. The intercept was 1.956, statistically significant different from 0 ($t = 4.502$, $P < 0.000$).

5. Multiple R² indicated that approximately 65.4% of the variation in Respect was predicted by the independent variables. Interpreted according to Cohen (1988), this suggested a large effect.
6. Estimated power to predict multiple R² was at 0.9999.

H1₀ was rejected. Only TL as a LS was significantly influencing Respect.

LS without CR and Innovative Work Behavior.

As explained in chapter 3, the basic multiple regression model tested was

$$IWB = \beta_{IWB_j} Leadership Style_{j_i} + \alpha_{IWB} Leadership Style + \epsilon_i$$

The tested statistical hypothesis were

H2₀: There is no statistically significant relationship between the leadership styles and innovative work behavior.

H2_a: There is a statistically significant relationship between the leadership styles and innovative work behavior.

Table 53 provides the corresponding correlation data and table 54 the detailed coefficient data.

		Correlations					
		Innovative Workbehavior	Monitors Deviations & Mistakes (MBEA)	Fights Fires (MBEP)	Avoids Involvement (LF)	Five I's of Transfor. Leadership	group
Pearson Correlation	IWB	1.000	.471	.010	-.347	.718	.140
	MBEA	.471	1.000	.342	.005	.385	.109
	MBEP	.010	.342	1.000	.453	-.268	-.255

LF	-.347	.005	.453	1.000	-.707	-.205
TL	.718	.385	-.268	-.707	1.000	.081
group	.140	.109	-.255	-.205	.081	1.000

Table 53: Correlation LS no CR on IWB

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.051	.414		2.536	.018
	MBEA	.021	.079	.046	.265	.794
	MBEP	.109	.109	.163	.999	.328
	LF	.146	.119	.256	1.223	.233
	TL	.501	.124	.912	4.054	.000
	group	.142	.127	.156	1.118	.275

Table 54: Coefficients LS no CR on IWB

The results of the multiple linear regression suggested that a significant proportion of the total variation in Innovative Work Behavior was predicted by TL, MBEA, MBEP, LF, Group, $F(5,24) = 7.540$, $p \leq 0.000$. Additionally, I found the following:

1. For TL, the unstandardized partial slope (0.501) and standardized partial slope (.912) were statistically significant from 0 ($t = 4.054$), $df = 5$, $p < 0.000$; with every one-point increase in TL, IWB will increase by 50/100 of one point when controlling for the other independent variables.
2. For all other independent variables (MBEA, MBEP, LF, Group), the partial slopes were not statistically significant.
3. The CI around the unstandardized partial slope of TL did not include 0 (TL, .246, .756), further confirming that this variable was a statistically significant predictor of IWB.

4. The intercept was 1.051, statistically significant different from 0 ($t = 2.536$, $P < 0.018$).
5. Multiple R^2 indicated that approximately 61.1% of the variation in IWB was predicted by the independent variables. Interpreted according to Cohen (1988), this suggested a large effect.
6. Estimated power to predict multiple R^2 was at 0.998986.

LS without TL and Innovative Work Behavior.

As explained in chapter 3, the basic multiple regression model tested was

$$IWB = \beta_{IWB_j} Leadership Style_{j_i} + \alpha_{IWB} Leadership Style + \varepsilon_i$$

The tested statistical hypothesis was

H2₀: There is no statistically significant relationship between the leadership styles and innovative work behavior.

H2_a: There is a statistically significant relationship between the leadership styles and innovative work behavior.

Table 55 provides the corresponding correlation data and table 56 the detailed coefficient data.

		Correlations					
		Innovative Workbehavior	Monitors Deviations & Mistakes (MBEA)	Fights Fires (MBEP)	Avoids Involvement (LF)	group	Rewards Achievement (CR)
Pearson	IWB	1.000	.471	.010	-.347	.140	.654
Correlation	MBEA	.471	1.000	.342	.005	.109	.221
	MBEP	.010	.342	1.000	.453	-.255	-.324

LF	-.347	.005	.453	1.000	-.205	-.714
group	.140	.109	-.255	-.205	1.000	.050
CR	.654	.221	-.324	-.714	.050	1.000

Table 55: Correlations LS no TL on IWB

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.212	.424		2.861	.009
	MBEA	.110	.072	.243	1.515	.143
	MBEP	.091	.114	.137	.804	.430
	LF	.086	.119	.151	.727	.474
	group	.130	.134	.142	.974	.340
	CR	.388	.109	.746	3.560	.002

Table 56: Coefficients LS no TL on IWB

The results of the multiple linear regression suggested that a significant proportion of the total variation in Innovative Work Behavior was predicted by CR, MBEA, MBEP, LF, Group, $F(5,24) = 6.393$, $p \leq 0.001$. Additionally, I found the following:

1. For CR, the unstandardized partial slope (0.388) and standardized partial slope (.746) were statistically significant from 0 ($t = 3.560$), $df = 5$, $p < 0.002$; with every one-point increase in CR, IWB will increase by 39/100 of one point when controlling for the other independent variables.
2. For all other independent variables (MBEA, MBEP, LF, Group), the partial slopes were not statistically significant.

3. The CI around the unstandardized partial slope of CR did not include 0 (CR, .163, .614), further confirming that this variable was a statistically significant predictor of IWB.
4. The intercept was 1.212, statistically significant different from 0 ($t = 2.861$, $P < 0.009$).
5. Multiple R^2 indicated that approximately 57.1% of the variation in IWB was predicted by the independent variables. Interpreted according to Cohen (1988), this suggested a large effect.
6. Estimated power to predict multiple R^2 was at 0.995842.

The hypotheses to be tested was

H3₀: There is no statistically significant relationship between a leadership style and innovative work behavior.

H3_a: There is a statistically significant relationship between a leadership style and innovative work behavior.

H3₀ was rejected. TL and CR were significantly influencing Innovative Work Behavior. However, due to the multicollinearity between TL and CR, it could not be differentiated between these two leadership styles.

LS and Proactivity.

As explained in chapter 3, the basic multiple regression model tested was

$$Proactivity = \beta_{Proactivity_j} Leadership Style_{j_i} + \alpha_{Proactivity Leadership Style} + \varepsilon_i$$

The tested statistical hypothesis were

H3₀: There is no statistically significant relationship between the leadership style and proactivity.

H3_a: There is a statistically significant relationship between the leadership style and proactivity.

Table 57 provides the corresponding correlation data and table 58 the detailed coefficient data.

Correlations

		Proactivity	CR	MBEA	MBEP	LV	TL	group
Pearson	Proactivity	1.000	.584	.472	-.168	-.400	.594	.311
Correlation	CR	.584	1.000	.232	-.314	-.694	.914	.050
	MBEA	.472	.232	1.000	.340	.049	.260	.109
	MBEP	-.168	-.314	.340	1.000	.470	-.290	-.230
	LV	-.400	-.694	.049	.470	1.000	-.715	-.176
	TL	.594	.914	.260	-.290	-.715	1.000	.059
	group	.311	.050	.109	-.230	-.176	.059	1.000

Table 57: Correlations LS on Proactivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.426	.512		2.783	.010
	CR	.145	.208	.237	.698	.492
	MBEA	.168	.078	.359	2.144	.042
	MBEP	-.075	.134	-.096	-.560	.580
	LV	.008	.146	.012	.054	.957
	TL	.160	.227	.252	.704	.488
	group	.241	.156	.225	1.541	.136

Table 58: Coefficients LS on Proactivity

The results of the multiple linear regression suggested that a significant proportion of the total variation in Proactivity was predicted by TL, CR, MBEA, MBEP, LF, Group, $F(6,25) = 4.866$, $p \leq 0.002$. Additionally, I found the following:

1. For MBEA, the unstandardized partial slope (0.168) and standardized partial slope (.359) were statistically significant from 0 ($t = 2.144$), $df = 6$, $p < 0.042$; with every one-point increase in MBEA, Proactivity will increase by 35/100 of one point when controlling for the other independent variables.
2. For all other independent variables (TL, CR, MBEP, LF, Group), the partial slopes were not statistically significant.
3. The CI around the unstandardized partial slope of MBEA did not include 0 (MBEA, .007, .329), further confirming that this variable was a statistically significant predictor of Proactivity.
4. The intercept was 1.426, statistically significant different from 0 ($t = 2.783$, $P < 0.010$).
5. Multiple R^2 indicated that approximately 53.9% of the variation in Proactivity was predicted by the independent variables. Interpreted according to Cohen (1988), this suggested a large effect.
6. Estimated power to predict multiple R^2 was at 0.982977.

H_{30} was rejected. Only MBEA as a LS was significantly influencing Proactivity.

Multiple Regression Analysis Summary.

The results of the multiple regression of LS and Respect suggested that a significant proportion of the total variation in Respect was predicted by the five leadership styles, $F(6, 24) = 10.430$, $p < 0.000$ with adjusted R^2 of 65.4% suggesting a large effect according to Cohen (1988). Additionally, I have found the following:

1. For TL, the unstandardized (.499) and standardized (.773) partial slope were statistically significantly different from 0 ($t = 2.735$, $df = 6$, $p < 0.012$); with every one-point increase in TL, Respect will increase by approximately 50/100 of one point when controlling for all other LS variables and GROUP.
2. The CI around the unstandardized partial slope of TL did not include 0 (TL, 0.123, .876), further confirming that this variable was a statistically significant predictor of Respect.
3. The intercept was 1.956, statistically significant different from 0 ($t = 4.502$, $df = 6$, $p < 0.000$).
4. Estimated power to predict multiple R^2 was at 0.999998. (Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G., 2009)

The hypotheses to be tested was

H_{10} : There is no statistically significant relationship between a Leadership Style and Respect.

H_{1a} : There is a statistically significant relationship between the Leadership Style and Respect.

H_{10} was rejected. TL and only TL was significantly influencing Respect.

The results of the multiple regression of LS without including CR into the model and Innovative Work Behavior suggested that a significant proportion of the total variation in Innovative Work Behavior was predicted by the four leadership styles, $F(5, 24) = 7.540$, $p < 0.000$ with adjusted R^2 of 53.0% suggesting a large effect according to Cohen (1988). Additionally, I have found the following:

1. For TL, the unstandardized (.501) and standardized (.912) partial slope were statistically significantly different from 0 ($t = 4.054$, $df = 5$, $p < 0.000$); with every one-point increase in TL, Innovative Work Behavior will increase by approximately 50/100 of one point when controlling for all other LS variables and GROUP.
2. The CI around the unstandardized partial slope of TL did not include 0 (TL, 0.246, 0.756), further confirming that this variable was a statistically significant predictor of Respect.
3. The intercept was 1.051, statistically significant different from 0 ($t = 2.536$, $df = 5$, $p < 0.018$).
4. Estimated power to predict multiple R^2 was at 0.998986 (Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G., 2009).

The results of the multiple regression of LS without including TL into the model and Innovative Work Behavior suggested that a significant proportion of the total variation in Innovative Work Behavior was predicted by the four leadership styles, $F(5, 24) = 6.393$, $p < 0.001$ with adjusted R^2 of 48.2% suggesting a large effect according to Cohen (1988). Additionally, I have found the following:

1. For CR, the unstandardized (.388) and standardized (.746) partial slope were statistically significantly different from 0 ($t = 3.560$, $df = 5$, $p < 0.002$); with every one-point increase in CR, Innovative Work Behavior will increase by approximately 39/100 of one point when controlling for all other LS variables and GROUP.
2. The CI around the unstandardized partial slope of CR did not include 0 (TL, 0.163, 0.614), further confirming that this variable was a statistically significant predictor of Respect.
3. The intercept was 1.212, statistically significant different from 0 ($t = 2.861$, $df = 5$, $p < 0.009$).
4. Estimated power to predict multiple R^2 was at 0.995842 (Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G., 2009).

The hypotheses to be tested was

H₂₀: There is no statistically significant relationship between a leadership style and innovative work behavior.

H_{2a}: There is a statistically significant relationship between a leadership style and innovative work behavior.

H₂₀ was rejected. TL and CR were significantly influencing Innovative Work Behavior. However, due to the multicollinearity between TL and CR, it could not be differentiated between these two leadership styles.

The results of the multiple regression of LS and Proactivity suggested that a significant proportion of the total variation in Proactivity was predicted by the five

leadership styles, $F(6, 25) = 4.866$, $p < 0.002$ with adjusted R^2 of 42.8% suggesting a large effect according to Cohen (1988). Additionally, I have found the following:

1. For MBEA, the unstandardized (.168) and standardized (.359) partial slope were statistically significantly different from 0 ($t = 2.144$, $df = 6$, $p < 0.042$); with every one-point increase in MBEA, Proactivity will increase by approximately 17/100 of one point when controlling for all other LS variables and GROUP.
2. The CI around the unstandardized partial slope of MBEA did not include 0 (MBEA, 0.007, .329), further confirming that this variable was a statistically significant predictor of Respect.
3. The intercept was 1.426, statistically significant different from 0 ($t = 2.783$, $df = 6$, $p < 0.010$).
4. Estimated power to predict multiple R^2 is at 0.982132 (Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G., 2009).

The hypotheses to be tested was

H₃₀: There is no statistically significant relationship between a leadership style and innovative work behavior.

H_{3a}: There is a statistically significant relationship between a leadership style and innovative work behavior.

H₃₀ was rejected. MBEA and only MBEA is significantly influencing Proactivity.

Mediation Model - Results

The two mediation analyses are presented.

Mediation - Transformational Leadership Style through Respect on Proactivity.

The hypothesis tested was:

H₄₀: Respect does not mediate the relationship between Transformational Leadership and Proactivity.

H_{4a}: Respect does mediate the relationship between Transformational Leadership and Proactivity.

The relationship between Transformational Leadership and Proactivity was mediated by Respect as figure 122 illustrates.

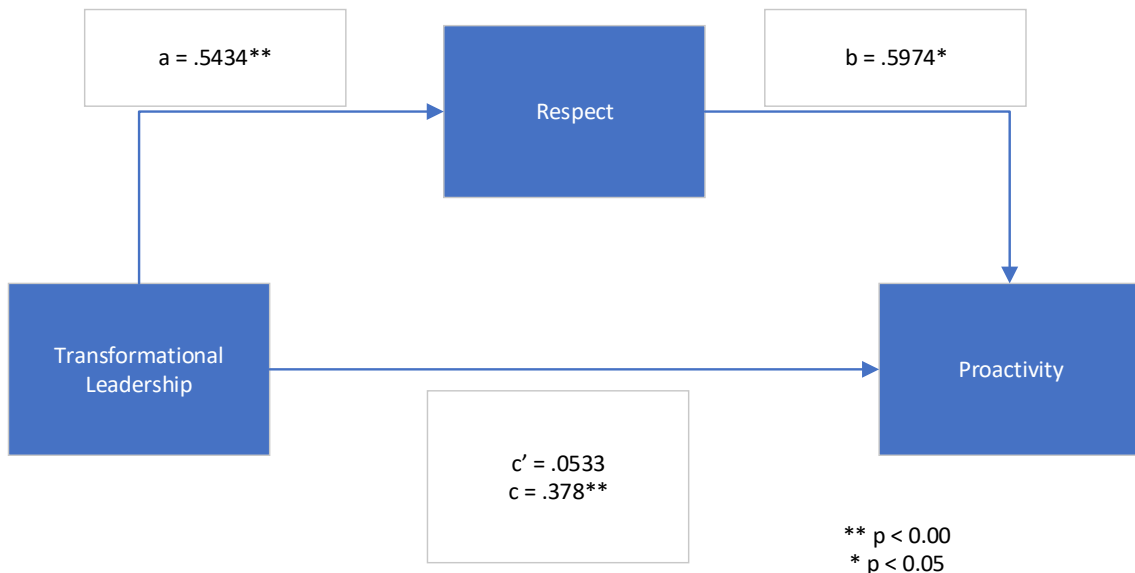


Figure 122: Transformational Leadership, Respect, IWB – Mediation

1) Transformational Leadership predicted Proactivity

$F(1,30) = .393, p < 0.0000, R^2 = .3534$

$b = .378 t(30) = 4.0488, p < 0.00$

2) Transformational predicted Respect

$F(1, 30) = 71.1465, p < 0.0000, R^2 = .7034$

$b = .5434 t(30) = 8.4348, p < 0.00$

3) Transformational Leadership and Respect predicted Proactivity

a) $F(2, 29) = 12.5145, p < 0.0000, R^2 = 0.4633$

b) Respect predicted Proactivity

a. $b = .5974 t(29) = 2.4368, p < 0.0212$

c) Transformational Leadership did not predict Proactivity

a. $b = 0.0533, t(29) = 0.3359, p < 0.7394$

All criteria for mediation were fulfilled.

I tested the significance of this indirect effect using bootstrapping procedures (Hayes, 2017). Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was $b = .3246$, and the 95% confidence interval ranged from .0479 to 0.6113. Additionally, I conducted the Sobel Test $z = 2.264$ with $p < 0.023$. This confirmed the results from the bootstrap procedure. Thus, the indirect effect was statistically significant.

H_4 was rejected.

Mediation - Transformational Leadership Style through Respect on Innovative Work Behavior

The hypothesis tested is:

H5₀: Respect does not mediate the relationship between Transformational Leadership and Innovative Work Behavior.

H5_a: Respect does mediate the relationship between Transformational Leadership and Innovative Work Behavior.

The relationship between Transformational Leadership and Innovative Work Behavior was mediated by Respect as figure 123 illustrates.

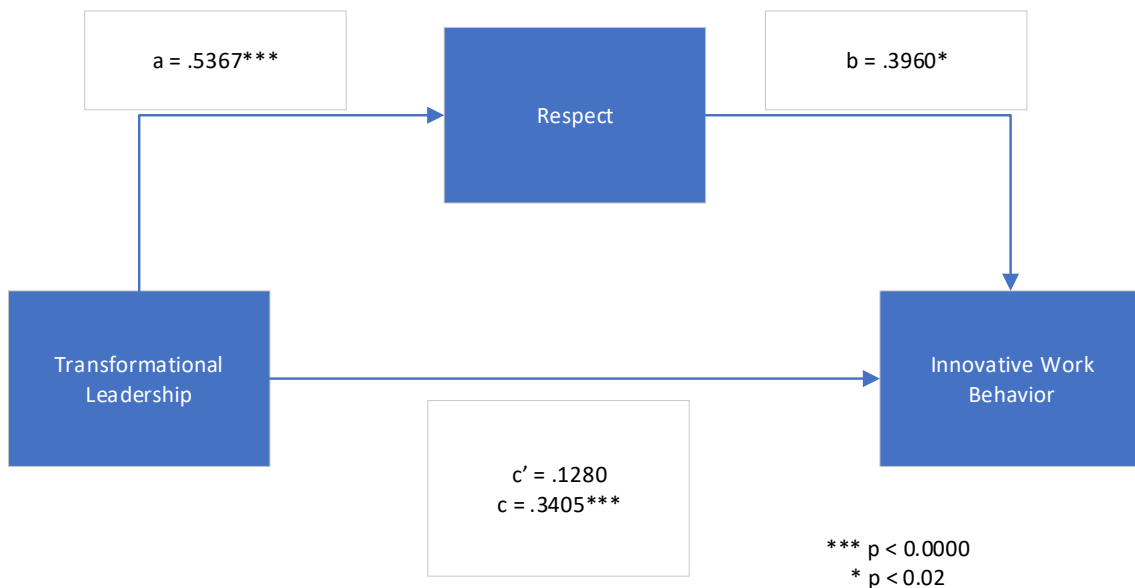


Figure 123: Transformational Leadership, Respect, IWB – Mediation

1) Transformational Leadership predicted Innovative Work Behavior

$F(1,28) = 29.1822, p < 0.0000, R^2 = .5103$

$b = .3405$ $t(30) = 5.4021$, $p < 0.0000$

2) Transformational Leadership predicted Respect

$F(1, 28) = 60.23$, $p < 0.0000$, $R^2 = .6826$

$b = .5367$ $t(28) = 7.7608$, $p < 0.0000$

3) Transformational Leadership and Respect predicted Innovative Work Behavior

a) $F(2, 27) = 20.4832$, $p < 0.0000$, $R^2 = 0.6027$

b) Respect predicted Innovative Work Behavior

a. $b = .3960$, $t(27) = 2.5061$, $p < 0.0185$

c) Transformational Leadership did not predict Innovative Work Behavior

a. $b = 0.1280$, $t(27) = 1.2471$, $p < 0.2231$

All criteria for mediation were fulfilled.

I tested the significance of this indirect effect using bootstrapping procedures.

Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect of Respect was $b = .2125$, and the 95% confidence interval ranged from .0502 to 0.3947.

Additionally, I conducted the Sobel Test $z = 2.385$ with $p < 0.0017$. This confirmed the results from the bootstrap procedure. Thus, the indirect effect was statistically significant.

$H5_0$ was rejected.

Mediation Analysis Summary.

Regression analysis was used to investigate the hypothesis 4 that Respect mediated the effect of Transformational Leadership on Proactivity. Results indicated that Transformational Leadership was a significant predictor of Proactivity, $b = .378$, $p < 0.00$, and that Transformational Leadership was a significant predictor of Respect, $b = .5434$, $p < 0.00$, and that respect was a significant predictor of Proactivity, $b = .5974$, $p < .02$. Transformational Leadership was no longer a significant predictor of Proactivity after controlling for the mediator, Respect, $b = 0.0533$, $p > 0.05$. This was consistent with full mediation. Approximately 46% of the variance in Proactivity was accounted for by the predictors ($R^2 = .4633$). The indirect effect was tested using a bootstrap estimation approach with 5000 samples (Hayes, 2017). These results indicated the indirect coefficient was significant, $b = .3246$, 95% LLCI = .0479, ULCI = 0.6113. The significance of the indirect effect was supported by Sobel's test with a z-values of $z = 2.264$ with $p < 0.023$.

The hypothesis tested was:

H₄₀: Respect does not mediate the relationship between Transformational Leadership and Proactivity.

H_{4a}: Respect does mediate the relationship between Transformational Leadership and Proactivity.

H₄₀ was rejected.

Regression analysis was used to investigate the hypothesis 5 that Respect mediated the effect of Transformational Leadership on Innovative Work Behavior.

Results indicated that Transformational Leadership was a significant predictor of Innovative Work Behavior, $b = .3405$, $p < 0.0000$, and that Transformational Leadership was a significant predictor of Respect, $b = .5367$, $p < 0.0000$, and that Respect was a significant predictor of Innovative Work Behavior, $b = 0.3960$, $p < 0.0185$.

Transformational Leadership was no longer a significant predictor of satisfaction after controlling for the mediator, Respect, $b = 0.1280$, $p < 0.2231$. This was consistent with full mediation. Approximately 60% of the variance in Innovative Work Behavior was accounted for by the predictors ($R^2 = 0.6027$). The indirect effect was tested using a bootstrap estimation approach with 5000 samples (Hayes, 2017). These results indicated the indirect coefficient was significant, $b = 0.2125$, 95% LLCI = .0502, ULCI = 0.3947. The significance of the indirect effect was supported by Sobel's test with a z-values of $z = 2.385$ with $p < 0.017$.

The hypothesis tested was:

H5₀: Respect does not mediate the relationship between Transformational Leadership and Innovative Work Behavior.

H5_a: Respect does mediate the relationship between Transformational Leadership and Innovative Work Behavior.

H5₀ was rejected.

Double Mediation Analysis - Transformational Leadership through Respect and Proactivity on Innovative Work Behavior.

The relationship between Transformational Leadership and Innovative Work Behavior was not fully mediated by Respect and Proactivity as figure 124 illustrates.

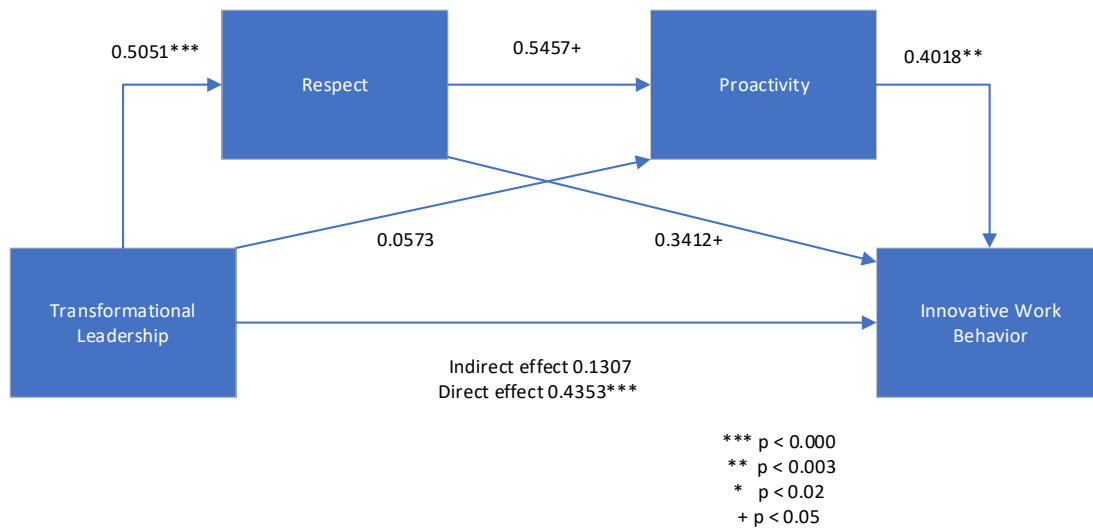


Figure 124: Transformational Leadership, Respect, Proactivity, IWB – Double Mediation

1) Transformational Leadership predicted Innovative Work Behavior

$$F(1,28) = 34.9093, p < 0.0000, R^2 = 0.5549$$

$$b = 0.4353, t(28) = 5.9084, p < 0.0000$$

2) Transformational Leadership predicted Respect

$$F(1, 28) = 53.4941, p < 0.0000, R^2 = .6564$$

$$b = .5021 t(28) = 7.3140, p < 0.0000$$

3) Transformational Leadership and Respect predicting Proactivity

a) $F(2, 27) = 9.8153, p < 0.0006, R^2 = 0.4210$

b) Respect predicted Proactivity

a. $b = .5457, t(27) = 2.2749, p < 0.0311$

c) Transformational Leadership did not predict Proactivity

a. $b = 0.0573, t(27) = 0.3855, p < 0.7029$

4) Transformational Leadership, Respect, and Proactivity predicting Innovative Work Behavior

a) $F(3,26) = 29.5826, p < 0.0000, R^2 = .7734$

b) Transformational Leadership did not predict Innovative Work Behavior

a. $b = 0.1307, t(26) = 1.408, p < 0.0473$

c) Respect did predict Innovative Work Behavior

a. $b = 0.3412, t(26) = 2.0824, p < 0.0473$

d) Proactivity did predict Innovative Work Behavior

a. $b = 0.4018, t(26) = 3.3363, p < 0.0026$

Not all criteria for double mediation were fulfilled. The path between Respect and Innovative Work Behavior was significant, which for perfect double mediation it shouldn't. However, I tested the significance of this indirect effect through double mediation by using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect of a double mediation model was $b = .1101$, and the 95% confidence interval ranged from 0.0082 to 0.3248. The other two paths (Transformational Leadership to Innovative Work Behavior mediated by Respect and Transformational Leadership to Innovative Work Behavior mediated by Proactivity) were crossing zero in their respective confidence intervals, confirming the above non-significant results but challenging the significant result of the path between Respect and

Innovative Work Behavior. Thus, the double mediation indirect effect might be statistically significant.

H₆₀: Respect and Proactivity do not mediate the relationship between Transformational Leadership and Innovative Work Behavior.

H_{6a}: Respect and Proactivity do mediate the relationship between Transformational Leadership and Innovative Work Behavior

H₆₀ was not rejected.

Double Mediation Analysis - Contingent Reward through Respect and Proactivity on Innovative Work Behavior.

The relationship between Contingent Reward and Innovative Work Behavior was not mediated by Respect and Proactivity as figure 125 illustrates

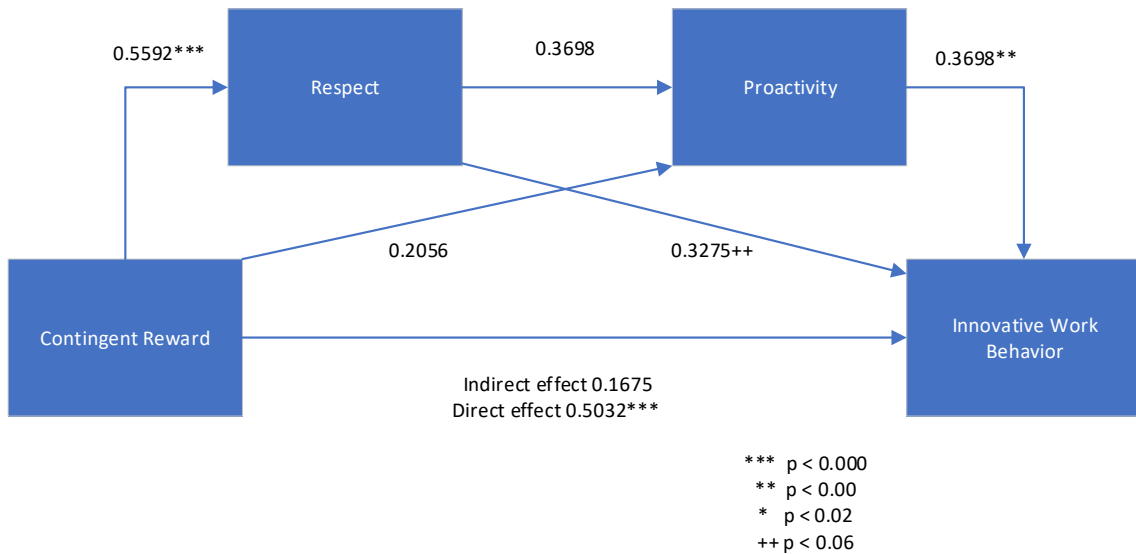


Figure 125: Contingent Reward, Respect, Proactivity, IWB – Double Mediation

- 1) Contingent Reward predicted Innovative Work Behavior

$F(1,28) = 46.0425, p < 0.0000, R^2 = 0.6218$

$b = 0.5032, t(28) = 6.7855, p < 0.0000$

2) Contingent Reward predicted Respect

$F(1, 28) = 60.1562, p < 0.0000, R^2 = .6824$

$b = .5592, t(28) = 77560, p < 0.0000$

3) Contingent Reward and Respect predicting Proactivity

a) $F(2, 27) = 11.0259, p < 0.0003, R^2 = 0.4496$

b) Respect did not predict Proactivity

a. $b = .3698, t(27) = 1.5201, p < 0.1401$

c) Contingent Reward did not predict Proactivity

a. $b = 0.2056, t(27) = 1.12483, p < 0.2226$

4) Contingent Reward, Respect, and Proactivity predicting Innovative Work

Behavior

a) $F(3,26) = 30.1997, p < 0.0000, R^2 = .7770$

b) Contingent Reward did not predict Innovative Work Behavior

a. $b = 0.1675, t(26) = 1.5535, p < 0.1324$

c) Respect did not predict Innovative Work Behavior

a. $b = 0.3275, t(26) = 2.0295, p < 0.0528$

d) Proactivity did predict Innovative Work Behavior

a. $b = 0.3698, t(26) = 3.0180, p < 0.0056$

Not all criteria for mediation were fulfilled. The path between Respect and Innovative Work Behavior was significant, which for perfect double mediation it

shouldn't be. However, I tested the significance of this indirect effect through double mediation by using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect of a double mediation model was $b = .0765$, and the 95% confidence interval ranged from -0.0168 to 0.2686. Thus, the double mediation indirect effect was not statistically significant.

H7₀: Respect and Proactivity do not mediate the relationship between Contingent Reward and Innovative Work Behavior.

H7_a: Respect and Proactivity do mediate the relationship between Contingent Reward and Innovative Work Behavior

H7₀ was not rejected.

But I tested the significance of the indirect effect through single mediation through Respect as shown in the figure above by using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect of the single mediation model was $b = .0765$, and the 95% confidence interval ranged from 0.0326 to 0.5216. Thus, the single mediation indirect effect was statistically significant.

Double Mediation Analysis - Management by Exception Active through Respect and Proactivity on Innovative Work Behavior.

The relationship between Management by Exception Active and Innovative Work Behavior was not mediated by Respect and Proactivity. As figure 126 illustrates

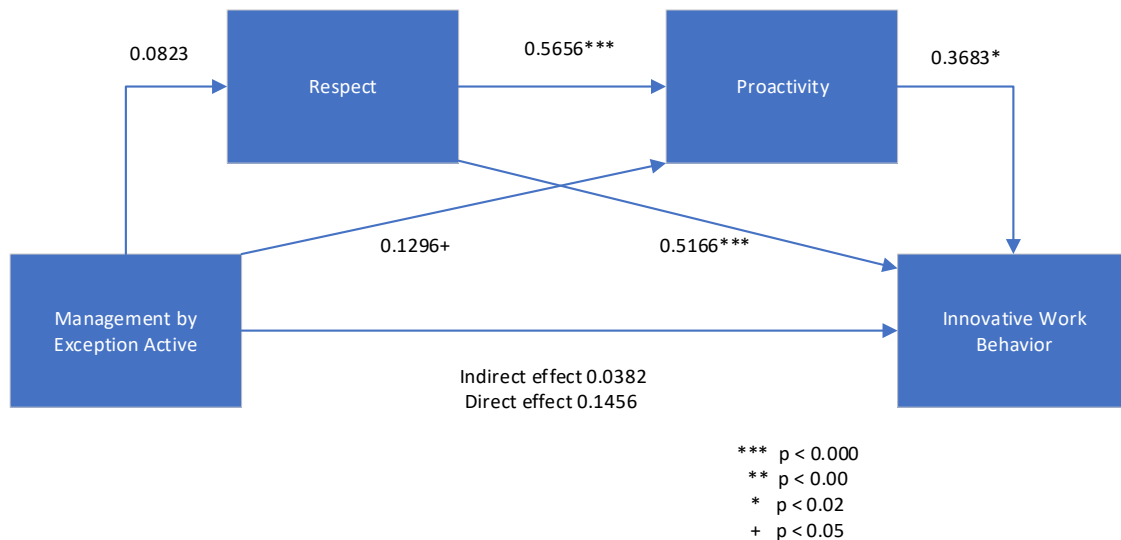


Figure 126: Management by Exception Active, Respect, Proactivity, IWB – Double Mediation

1) Management by Exception Active did not predict Innovative Work Behavior

$$F(1,28) = 3.9334, p < 0.0572, R^2 = 0.1232$$

$$b = 0.1456, t(28) = 1.9833, p < 0.0572$$

2) Management by Exception Active did not predict Respect

$$F(1, 28) = 1.0137, p < 0.3226, R^2 = .0349$$

$$b = .0823, t(28) = 1.0068, p < 0.3226$$

3) Management by Exception Active and Respect predicting Proactivity

d) $F(2, 27) = 13.9695, p < 0.0001, R^2 = 0.5085$

e) Respect does predict Proactivity

a. $b = .5656, t(27) = 4.2891, p < 0.0002$

f) Management by Exception Active does predict Proactivity

a. $b = 0.1296, t(27) = 2.2329, p < 0.0340$

4) Management by Exception Active, Respect, and Proactivity predicting Innovative Work Behavior

e) $F(3,26) = 27.9375, p < 0.0000, R^2 = .7770$

f) Management by Exception Active did not predict Innovative Work Behavior

a. $b = 0.0382, t(26) = 0.8716, p < 0.3914$

g) Respect did predict Innovative Work Behavior

a. $b = 0.5166, t(26) = 4.3516, p < 0.0002$

h) Proactivity did predict Innovative Work Behavior

a. $b = 0.3683, t(26) = 2.7561, p < 0.0105$

The criteria for mediation were not fulfilled.

H₀: Respect and Proactivity do not mediate the relationship between Management by Exception Active and Innovative Work Behavior.

H_a: Respect and Proactivity do mediate the relationship between Management by Exception Active and Innovative Work Behavior

H₀ was not rejected.

Double Mediation Analysis - Management by Exception Passive through Respect and Proactivity on Innovative Work Behavior.

The relationship between Management by Exception Passive and Innovative Work Behavior was not mediated by Respect and Proactivity as figure 127 illustrates.

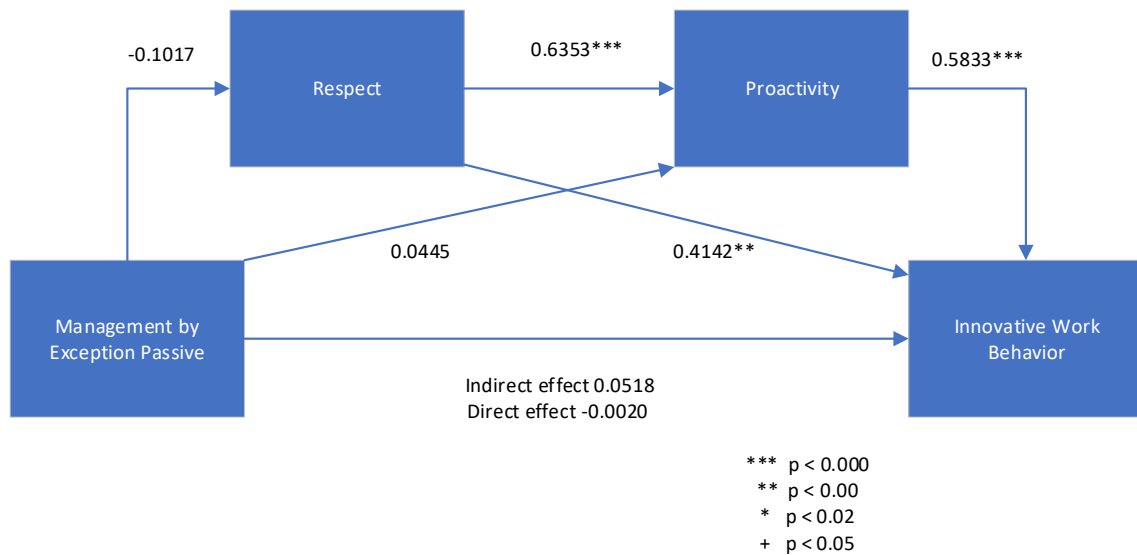


Figure 127: Management by Exception Passive, Respect, IWB – Mediation

1) Management by Exception Passive did not predict Innovative Work Behavior

$$F(1,29) = 0.0002, p < 0.9893, R^2 = 0.0000$$

$$b = -0.0020. t(29) = -0.0135, p < 0.9893$$

2) Management by Exception Passive did not predict Respect

$$F(1,29) = 0.5271, p < 0.4736, R^2 = 0.0179$$

$$b = -0.1017. t(29) = -0.7260, p < 0.4736$$

3) Management by Exception Passive and Respect predicting Proactivity

$F(2, 28) = 8.5968, p < 0.0012, R^2 = 0.3804$

a) Respect predicted Proactivity

$b = .6353, t(28) = 4.1429, p < 0.0003$

b) Management by Exception Passive did not predict Proactivity

$b = 0.0445, t(28) = 0.3815, p < 0.7057$

4) Management by Exception Passive, Respect, and Proactivity predicting
Innovative Work Behavior

$F(3,27) = 24.2559, p < 0.0000, R^2 = .7294$

a) Management by Exception Passive did not predict Innovative Work
Behavior

$b = 0.0518, t(27) = 0.6319, p < 0.5328$

b) Respect predicted Innovative Work Behavior

$b = 0.4142, t(27) = 3.0359, p < 0.0053$

c) Proactivity did predict Innovative Work Behavior

a. $b = 0.5833, t(27) = 4.4052, p < 0.0002$

The criteria for mediation were not fulfilled.

H₀: Respect and Proactivity do not mediate the relationship between
Management by Exception Active and Innovative Work Behavior.

H_a: Respect and Proactivity do mediate the relationship between Management by
Exception Active and Innovative Work Behavior

H₀ was not rejected.

Double Mediation Analysis - Laissez Fair through Respect and Proactivity on Innovative Work Behavior.

The relationship between Laissez Fair and Innovative Work Behavior was not fully mediated by Respect and Proactivity as figure 128 illustrates.

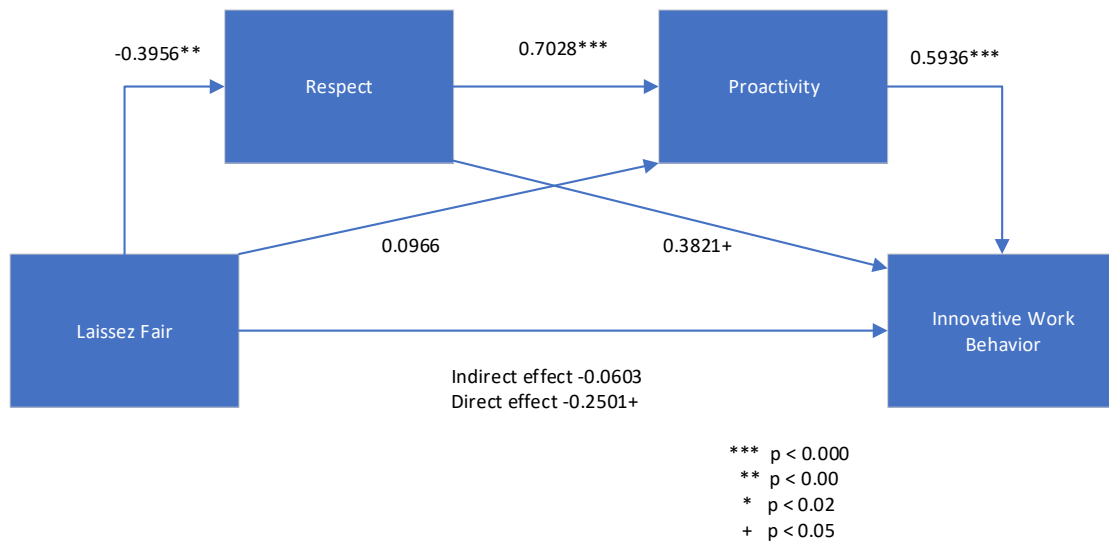


Figure 128: Laissez Fair, Respect, Innovative Work Behavior – Mediation

1) Laissez Fair predicted Innovative Work Behavior

$$F(1,29) = 4.5946, p < 0.0406, R^2 = 0.1368$$

$$b = -0.2801, t(29) = -2.1435, p < 0.0406$$

2) Laissez Fair predicted Respect

$$F(1, 29) = 12.9417, p < 0.0012, R^2 = .3086$$

$$b = -0.3956, t(29) = -3.5975, p < 0.0012$$

3) Laissez Fair and Respect predicting Proactivity

- g) $F(2, 28) = 8.9285, p < 0.0010, R^2 = 0.3894$
- h) Respect did predict Proactivity
 - a. $b = .7028, t(28) = 3.8736, p < 0.0006$
- i) Laissez Fair did not predict Proactivity
 - a. $b = 0.0966, t(28) = 0.7475, p < 0.4610$
- 4) Laissez Fair, Respect, and Proactivity predicting Innovative Work Behavior
 - i) $F(3,27) = 23.8349, p < 0.0000, R^2 = .7259$
 - j) Laissez Fair did not predict Innovative Work Behavior
 - a. $b = -0.0603, t(27) = 1.5535, p < 0.1324$
 - k) Respect did predict Innovative Work Behavior
 - a. $b = 0.3821, t(27) = 2.3927, p < 0.0239$
 - l) Proactivity did predict Innovative Work Behavior
 - a. $b = 0.5936, t(27) = 4.4244, p < 0.0001$

Not all criteria for mediation are fulfilled. The path between Respect and Innovative Work Behavior was significant, which for perfect double mediation it shouldn't be. However, I tested the significance of this indirect effect through double mediation by using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect of a double mediation model was $b = .0765$, and the 95% confidence interval ranged from -0.3996 to -0.0401. The other two paths (Laissez Fair to Innovative Work Behavior mediated by Respect and Laissez Fair to Innovative Work Behavior mediated by Proactivity) were crossing zero in their

respective confidence intervals, confirming the above non-significant results but challenging the significant result of the path between Respect and Innovative Work Behavior. Thus, the double mediation indirect effect might be statistically significant.

H10₀: Respect and Proactivity do not mediate the relationship between Laissez Fair and Innovative Work Behavior.

H10_a: Respect and Proactivity do mediate the relationship between Laissez Fair and Innovative Work Behavior

H10₀ was not rejected.

Double Mediation Analysis Summary.

All double mediation hypothesis were rejected. However, following the bootstrapping verification of significance, two double mediation models might be statistically significant. The leadership styles TL (positively) and LF (negatively) influencing IWB through Respect and Proactivity. Also, both models seemed to support a partial double mediation through the conducted analysis.

Mediation Analysis Summary.

Model	Result
TL -> Respect -> Proactivity	mediation confirmed
TL -> Respect -> IWB	mediation confirmed
TL -> Respect -> Proactivity -> IWB	partial double mediation, possible full double mediation
CR -> Respect -> Proactivity -> IWB	No double mediation
MBEA -> Respect -> Proactivity -> IWB	No double mediation
MBEP -> Respect -> Proactivity -> IWB	No double mediation
LF -> Respect -> Proactivity -> IWB	partial double mediation, possible full double mediation

Table 59: Mediation Analysis Summary

CHAPTER 5: Discussion and Conclusion

A systematic literature review of lean leadership indicated that a used leadership style might influence the perceived respect of employees, their proactivity, and innovate work behavior (IWB). Therefore, the current study was an effort to investigate these relationships and provide a deeper insight of leadership styles' effect on Respect, Proactivity, and IWB. All four variables were measured through one combined survey. It is important to notice that only sub-ordinate data was used to define a leader's leadership style and the perceived Respect, Proactivity, and IWB of the sub-ordinates.

Overview of the Findings

The purpose of this study was to examine the relationship between Leadership Style and Lean Management expressed through Respect, Proactivity, and Innovative Work Behavior (IWB).

Transformational leadership was found to be a predictor of respect with large effect size while using a multiple-regression model (all Leadership Styles on Respect), confirming the first hypothesis.

MBEA was found to be a predictor of proactivity with large effect size while using a multiple-regression model (all Leadership Styles on Proactivity). This finding did not support the second hypothesis championing Transformationa Leadership, but the hypotheses that one leadership style supports Proactivity was confirmed.

Either Transformational Leadership (TL) or Contingent Reward leadership (CR) explained Innovative Work Behavior (IWB) with a large effect size while using a multiple-regression model (all Leadership Styles less TL or less CR on IWB). It is important to notice that no leadership styles predicted IWB if in the multiple-regression

model all five leadership styles (TL, CR, MBEA, MBEA, LF) are present due to the multicollinearity of TL and CR. This did not support the third hypothesis championing Transformational Leadership. But the hypotheses that a leadership style does support IWB was confirmed. However, the leadership styles relevant are CR or TL and due to the multicollinearity issue it cannot be distinguished between them.

To further analyze the data, two types of mediation analysis were conducted. A full mediation of Transformational Leadership through Respect to Proactivity was confirmed (Figure 129).

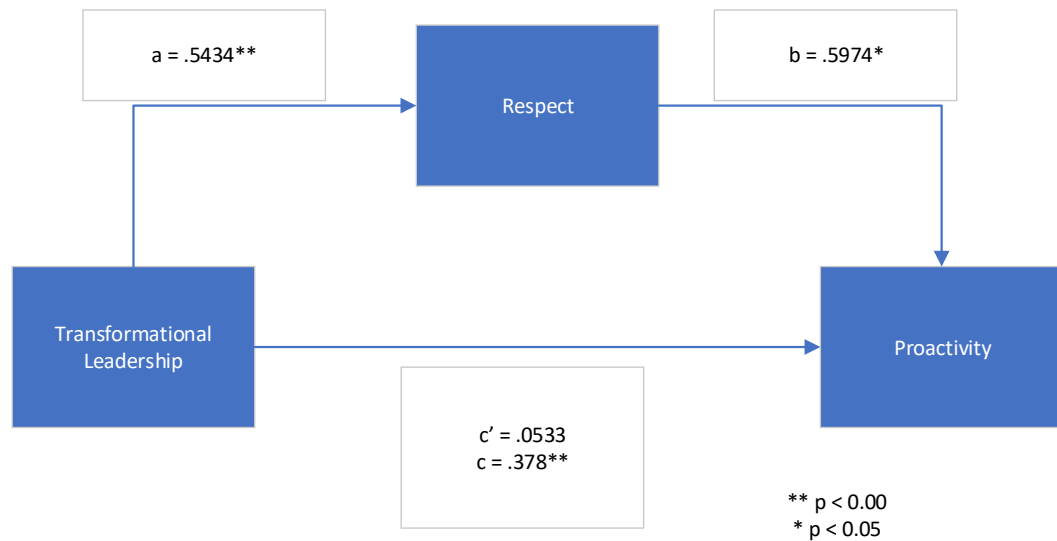


Figure 129: Transformational Leadership, Respect, IWB – Mediation

A full mediation of Transformational Leadership through Respect to IWB was confirmed (Figure 130).

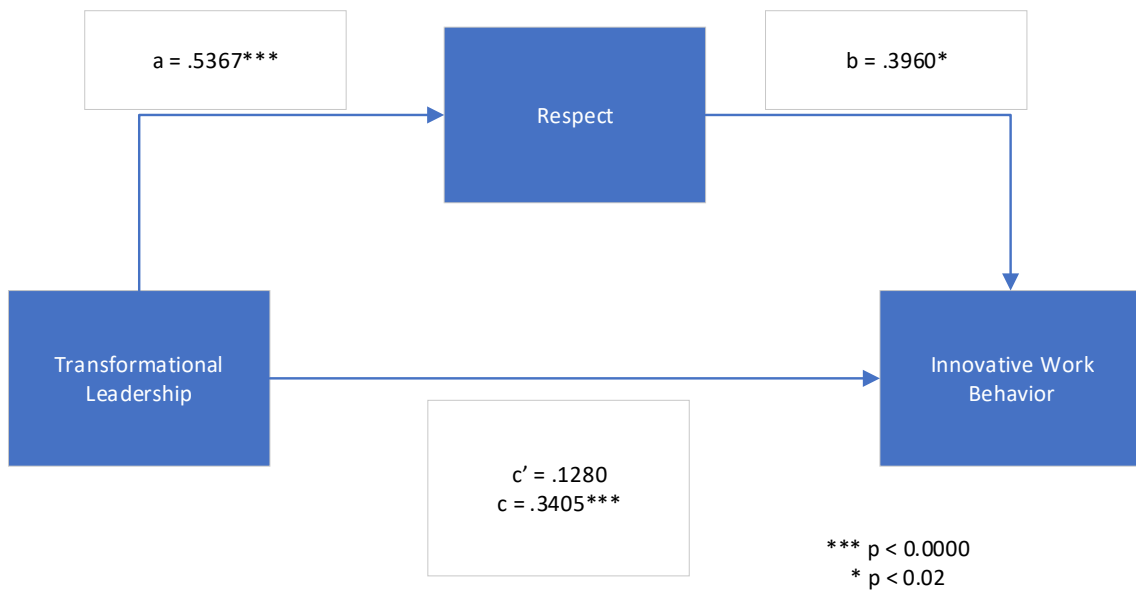


Figure 130: Transformational Leadership, Respect, IWB – Mediation

A partial double mediation of Transformational Leadership through Respect and Proactivity to IWB was confirmed (Figure 131). Not surprisingly, a mediation from TL through Respect to IWB was confirmed in this model, too. Attention requires the variable Proactivity, which seemed to predict IWB better than Respect in this model.

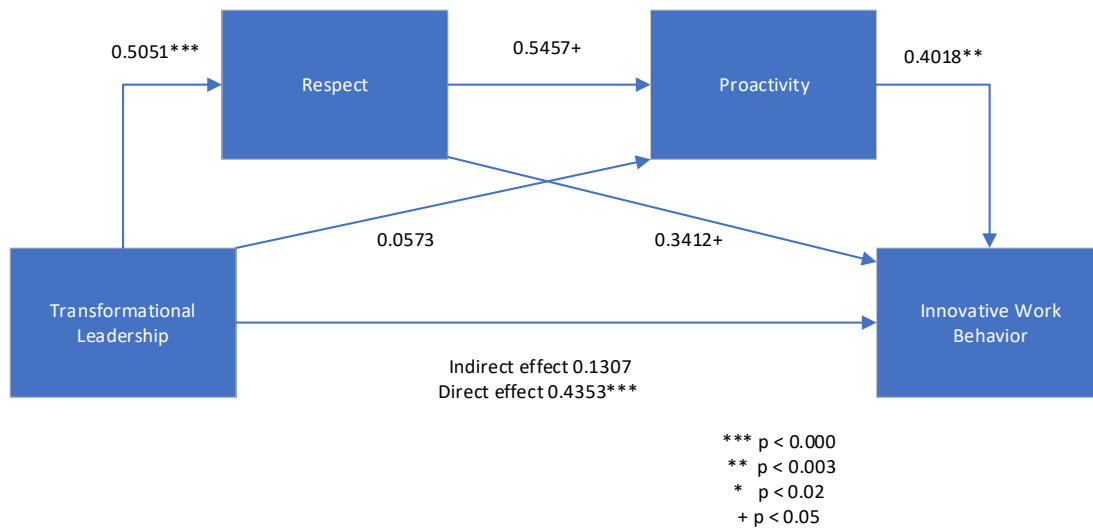


Figure 131: Transformational Leadership, Respect, Proactivity, IWB – Double Mediation

The results of the positive effect of TL on IWB and Respect were consistent with prior literature (Si, & ei, 2012; Aryee, Walumbwa, Zhou, & Hartnell, 2012). But both studies (Si, & Wei, 2012; Aryee et al., 2012) used different mediator/moderator variables. The variables used in the current study are related to lean leadership.

A double mediation analysis of CR through Respect and Proactivity to IWB was conducted to compare the effect of CR to TL (Figure 132). The double mediation was not confirmed, but a mediation of CR through Respect to IWB was indicated. It seems to be important to notice that CR and Respect did not predict Proactivity and that statistically significant only Proactivity predicted IWB ($p < 0.05$) while controlling for Respect and CR. However, CR did predict IWB and Respect when used in a single regression. The result is consistent with the current literature. The positive effects of CR on other organizational variables is well documented in the literature (i.e. Breevaart, Bakker, Hetland, Demerouti, Olsen, & Espevik, 2014). But taking into account the multiple regression result (LS on IWB) above and this double mediation result, it might be that a)

CR and TL are too similar to provide deeper insight into other organizational variables, and b) that CR does not have an effect on another organizational variables like Proactivity if controlled by other organizational variables, in this case Respect. The results of this study cast a shadow of doubt if CR is truly a desirable leadership style. This is consistent with the lean leadership literature, which implies that CR might not be as desirable as leadership style (i.e. Liker, & Franz, 2012; Hach, 2009; Angelis et al., 2011; Badurdeen, & Gregory, 2012; Sturdevant, 2014; Markovitz, 2016; Clark, 2016; Liker, & Hoseus, 2010; Blader et al., 2015).

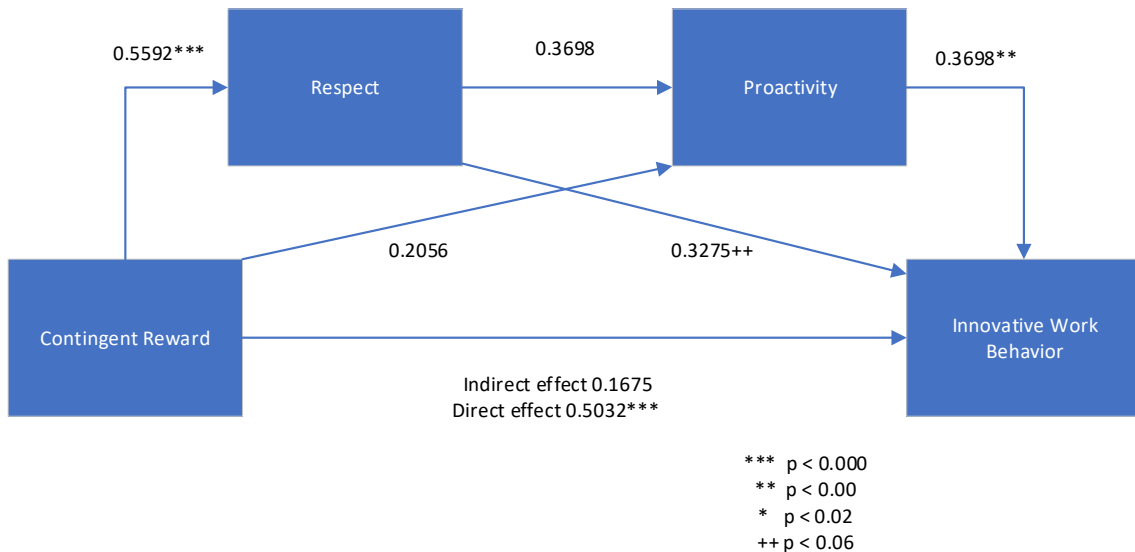


Figure 132: Contingent Reward, Respect, Proactivity, IWB – Double Mediation

To analyze further the effect of MBEA a double mediation analysis was conducted (Figure 133). A double mediation effect was not confirmed, but a mediation of MBEA through Proactivity to IWB was indicated. It is important to notice that MBEA did not predict Respect, but MBEA did have an effect on Proactivity while controlling for Respect. Respect and Proactivity seemed to predict IWB while controlling for MBEA.

But MBEA did not have an effect on IWB or Respect in a single regression. The literature indicates that measurements are important for lean leadership (i.e. Hillberg, 2015; Semiklose, 2014; Raines, 2011; Petersen, 2010; Mróz. 2010; Jusko, 2011; Sarkar, 2011; Netland, 2016). The central element of the MBEA leadership style is to measure deviations from desired values or goals. MBEA seemed to influence Proactivity and indirectly IWB.

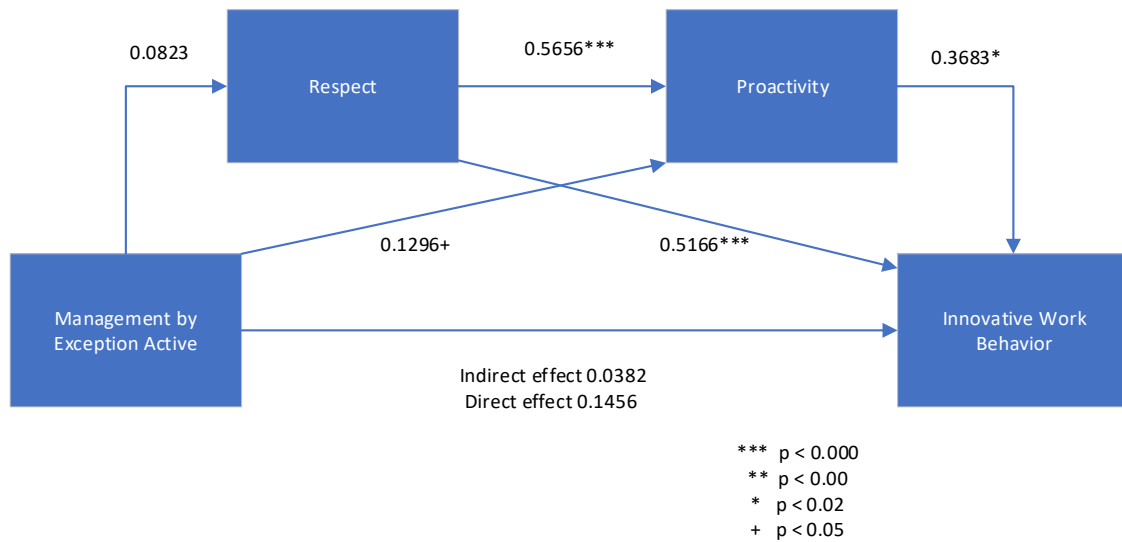


Figure 133: Management by Exception Active, Respect, Proactivity, IWB – Double Mediation

A double mediation analysis of MBEP through Respect and Proactivity to IWB revealed that MBEP did not have any effect on the other three variables (Figure 134). This is consistent with the literature (i.e. Podsakoff, Todor, & Skov, 1982).

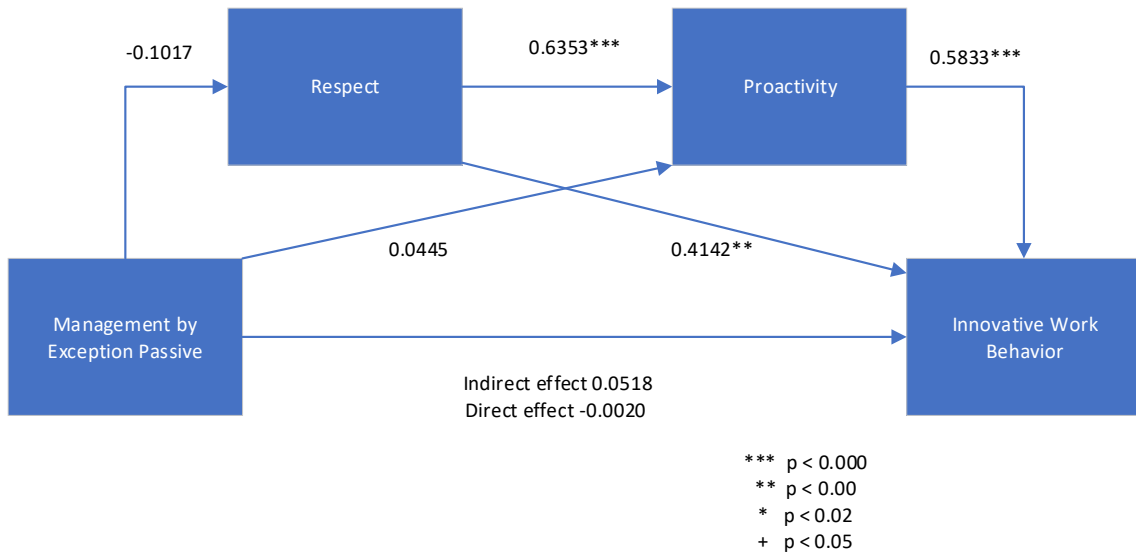


Figure 134: Management by Exception Passive, Respect, IWB – Mediation

A double mediation analysis of LF through Respect and Proactivity to IWB revealed a similar effect like TL. However, the effect of LF was negative and the effect of TL was positive (Figure 135). This result is consistent with the literature (i.e. Zwingmann, Wegge, Wolf, Rudolf, Schmidt, & Richter, 2014; Eagly, & Johannesen-Schmidt, 2014; Judge, & Piccolo, 2004).

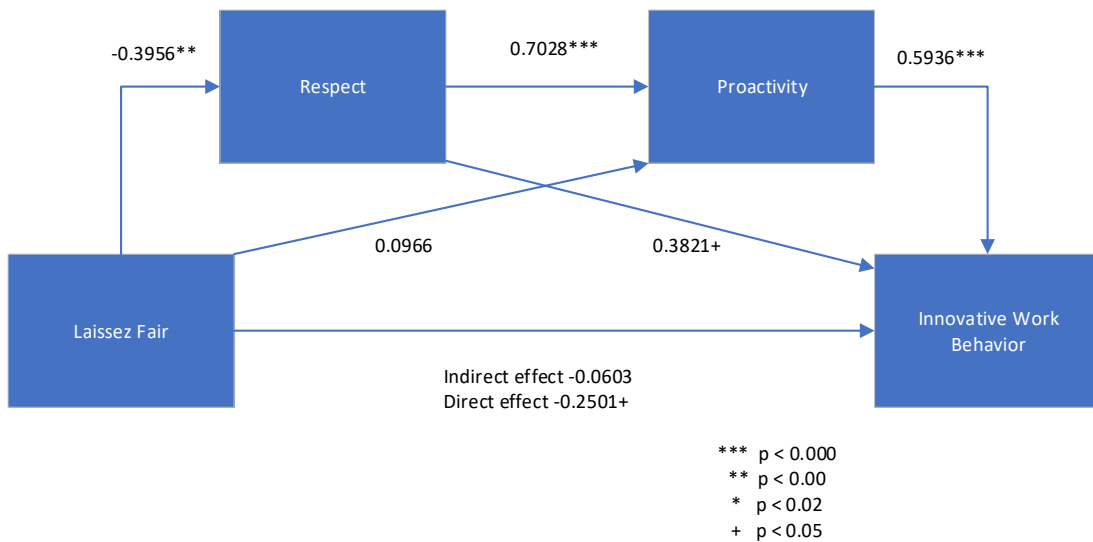


Figure 135: Laissez Fair, Respect, Innovative Work Behavior – Mediation

Implications

Implications for the Practitioner.

Bashin (2012a) reported as prominent obstacles, management and cultural problems, to introduce a lean management system. The only other obstacle mentioned was funding. It might be debatable if funding is really an obstacle or might be an excuse to avoid lean management. Bashin's results were confirmed by Abolhassani, Layfield, & Gopalakrishnan (2016), who also reported cultural problems as a main barrier. This is not surprising as there are two principles in lean, respect for people and continuous improvement (Minter, 2015; Kahlen & Patel, 2011; Li, 2008; Zarbo, 2012; Höök & Stehn, 2008; Grunden, 2009; Liker & Hoseus, 2010). Both principles target the culture of an organization. In this study, it was shown that respect of employees can be achieved through Transformational Leadership. It was shown in two simple mediation analyses that Transformational Leadership drives through Respect the dependent variables Proactivity and Innovative Work Behavior. In two double mediation analyses, it was shown that Transformational Leadership might drive through Respect and Proactivity Innovative Work Behavior and that MBEA might drive through Proactivity Innovative Work Behavior, which for the lean practitioner is not a surprise due to the Hosni Kanri lean tool (Hillberg, 2015; Sarkar, 2011; Netland, 2016).

The current approach to introduce lean relies on teaching lean tools and starting lean projects. This might explain the reported high failure rates of lean initiatives (Bashin, 2012a). In contrast, the practitioner can use a tool, the MLQ, to measure the

leadership styles of the management. Based on its findings, a training program can be developed to help managers change into a transformational leadership style. Maybe a practitioner also would like to develop, parallel to the Transformational Style, an MBEA style to prepare lean implementation. For being able to use an MBEA style, it is necessary to create KPIs. Currently organizations frequently use financial KPIs as the financial markets require the same. This might be an issue regarding innovative work behavior because a financial result is an outcome of human activity. Humans can drive results through activities, thus, KPIs should be focused on activities influenced by human activity. Therefore, it might be promising for leadership to find exclusively non-financial goals to guide the human activity into desirable improvement actions while considering the financial impact of these non-financial goals.

The key to introduce and sustain lean seems to be, first to develop a new management behavior to create a sincere feeling of being respected as an employee. And second, to create a non-financial goal system to guide the proactive employee into desirable innovative work behavior.

Implications for Future Research.

A gap in the literature exists in the lean leadership theory. The existing models seem to lack conceptual thoughts (e.g. Dombrowski, & Mielke, 2013). Therefore, I developed a conceptual model of lean leadership. In this study, I verified this model only based on four major variables to test a specific portion of it. A lot more work needs to be done to develop a deeper understanding of the suggested lean leadership model.

In the model, beliefs and values are mentioned. Research in this area will likely require also qualitative analysis as no academic knowledge seems to exist about the beliefs and values of lean leaders. What are they?

Quantitative research could be done to explain observable behaviors of lean organizations. Do these behaviors have a positive impact on Respect, Proactivity, and Innovative Work Behavior? Do they have a positive impact on the suggested leadership style?

An interesting variable might be culture. The conceptual model suggests a moderating effect between leaders and organizational behavior. How does culture influence the outcome of lean leadership? Is culture a moderator or maybe a mediator?

Time is a variable not mentioned in the conceptual lean leadership model. However, it might be interesting to analyze how long it takes if the transformational leadership improves the perceived employees' respect, and thus the proactivity and innovative work behavior of employees.

In parts of the leadership literature a hierarchal view of the full range leadership model is supported (e.g. Spinelli, 2006). But also the idea is presented that a transactional leadership style should be supported by a transformational leadership (Bass, 1985). So, a gap exist. Is a hierarchal model correct or a more complicated model needs to be developed? Which transactional style should be combined with transformational leadership? The study showed that a combination of transformational and management by exemption (active) leadership styles might be promising to pursue. The study addressed both gaps, a hierarchal view is not supported and a suggestion to combine the lower ranked transactional MBEA style with transformational leadership is made.

An issue of this study was that only North American organizations were included and not enough female managers were included. The results might change with a different mix of cultures and genders involved. The gender variable might inform the lean leadership phenomenon especially. Does a gender difference exist within the relationship of leadership style to respect? Do employees show a different reaction in their proactivity and innovative work behavior due to the leader's gender?

The current study was focused on manufacturing companies. How is the relationship between the variable within other industries like service, sports industry?

A further issue is that Transformational Leadership by itself has five factors (Bass, & Bass, 2008). Which of these factors in the context of lean leadership are important?

Additional research should be conducted to help us better understand the phenomena of lean leadership and for which kind of organization lean leadership is desirable.

Conclusion

The research in the leadership aspect of lean management is still in its infancy. The current study took the first step to investigate the relation between leadership styles and the two fundamental principles of lean management, respect for people expressed through Respect and continuous improvement expressed through Proactivity and Innovative Work Behavior. The five supported hypotheses and the rejected double mediation hypotheses contributed to the advancement of lean leadership research in the

following ways. First, this study provided a new conceptualization of lean leadership that includes leadership styles, respect, proactivity, and innovative work behavior. Second, this is the first study which uses multivariate regression, mediation, and double mediation models to examine the relationships of leadership styles to respect, proactivity, and innovative work behavior. Further studies are needed to increase the knowledge about lean leadership.

APPENDICES

Appendix A

Respectful Leadership Scale

Items

- (1) trusts my ability to independently and self-reliantly perform well
- (2) expresses criticism in an objective and constructive way
- (3) recognizes me as a full-fledged counterpart
- (4) recognizes my work
- (5) shows a genuine interest in my opinions and assessments
- (6) does not try to hold me responsible for his/her own mistakes
- (7) unequivocally stands up for me and my work against third parties
- (8) treats me in a polite manner
- (9) provides me with any information that is relevant to me
- (10) takes me and my work seriously
- (11) interacts in an open and honest way with me
- (12) treats me in a fair way

As found in

Quaquebeke, N., & Eckloff, T. (2010). Defining Respectful Leadership: What It Is, How It Can Be Measured, and Another Glimpse at What It Is Related to. *Journal of Business Ethics*, 91(3), 343–358.

Innovative Work Behavior

- (1) Do you create new ideas for difficult issues?
- (2) Do you search out new working methods, techniques, or instruments?
- (3) Do you generate original solutions for problems?
- (4) Do you mobilize support for innovative ideas?
- (5) Do you acquire approval for innovative ideas?
- (6) Do you make important organizational members enthusiastic for innovative ideas?
- (7) Do you transform innovative ideas into useful applications?
- (8) Do you introduce innovative ideas into the work environment in a systematic way?
- (9) Do you evaluate the utility of innovative ideas?

On a Likert Scale from 1 to 5 step 1 (over 0 to 4, step 1) from (1) never, (2) rarely, (3) sometimes, (4) frequently, (5) always

This is an instrument found in an article from Onne Janssen. Please see article.

Janssen, O. (2000). Job demands, perceptions of effort--reward fairness and innovative work behaviour. *Journal of Occupational & Organizational Psychology*, 73(3), 287–302.

Proactive Scale

1. I am constantly on the lookout for new ways to improve my life
2. I feel driven to make a difference in my community, and maybe the world
3. I tend to let others take the initiative to start new projects
4. Wherever I have been, I have been a powerful force for constructive change
5. I enjoy facing and overcoming obstacles to my ideas
6. Nothing is more exciting than seeing my ideas turn into reality
7. If I see something I don't like, I fix it
8. No matter what the odds, if I believe in something I will make it happen
9. I love being a champion for my ideas, even against others' opposition
10. I excel at identifying opportunities
11. I am always looking for better ways to do things
12. If I believe in an idea, no obstacle will prevent me from making it happen
13. I love to challenge the status quo
14. When I have a problem, I tackle it head-on
15. I am great at turning problems into opportunities
16. I can spot a good opportunity long before others can
17. If I see someone in trouble, I help out in any way I can

On a Likert Scale from 1 to 5 step 1 (over 0 to 4, step 1) from (1) never, (2) rarely, (3) sometimes, (4) frequently, (5) always

This is an instrument published by Bateman, Crant. Please see article.

Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior*, 14(2), 103–118.

Appendix B

Organization	Facility	Leader Last Name	Middle Name	First Name	Hierarchical level	email

Appendix C

IRB Approval



*Office of the
Institutional Review Board*

DATE: August 11, 2017

REFERENCE #: 16317
PROJECT ID & TITLE: [1102150-1] The relationship of Leadership Style to Respectful Leadership, Innovative Work Behavior, and Pro-Active Personality
PI OF RECORD: Victor Law, Ph.D.
SUBMISSION TYPE: New Project

BOARD DECISION: DETERMINATION OF EXEMPT
EFFECTIVE DATE: August 11, 2017
REVIEW CATEGORY: Exempt category # 2

DOCUMENTS:

- Advertisement - Recruitment email (UPDATED: 08/8/2017)
- Advertisement - OILS Sustain Lean v005.pptx (UPDATED: 08/8/2017)
- Application Form - Project_Information Form (UPDATED: 08/10/2017)
- Consent Form - Consent Survey (UPDATED: 07/17/2017)
- CV/Resume - CV Law (UPDATED: 07/17/2017)
- Other - Translation forms Spanish English signed.pdf (UPDATED: 08/10/2017)
- Other - Departmental Review (UPDATED: 07/17/2017)
- Other - Project Team (UPDATED: 07/17/2017)
- Protocol - Protocol (UPDATED: 07/17/2017)
- Questionnaire/Survey - MLQ German Spanish.docx (UPDATED: 08/8/2017)
- Questionnaire/Survey - Additional surveys for followers and leaders translation german spanish (UPDATED: 08/8/2017)
- Questionnaire/Survey - Survey (UPDATED: 07/17/2017)

- Training/Certification - CITI Law (UPDATED: 07/17/2017)
- Training/Certification - CITI Martens incomplete (UPDATED: 07/17/2017)
- Training/Certification - CITI Martens (UPDATED: 07/17/2017)

Thank you for your New Project submission. The UNM IRB has determined that this project is EXEMPT from IRB oversight according to federal regulations. Because it has been granted exemption, this research project is not subject to continuing review. It is the responsibility of the researcher(s) to conduct this project in an ethical manner.

If Informed Consent is being obtained, use only approved consent document(s).

This determination applies only to the activities described in the submission and does not apply should any changes be made to this project. If changes are being considered, it is the responsibility of the Principal Investigator to submit an amendment to this project for IRB review and receive IRB approval

prior to implementing the changes. A change in the research may disqualify this research from the current review category.

The Office of the IRB can be contacted through: mail at MSC02 1665, 1 University of New Mexico, Albuquerque, NM 87131-0001; phone at 505.277.2644; email at irbmaincampus@unm.edu; or in-person at 1805 Sigma Chi Rd. NE, Albuquerque, NM 87106. You can also visit the OIRB website at irb.unm.edu.

Informed Consent Forms

The relationship of Leadership Style to Respectful Leadership, Innovative Work Behavior, and Pro-Active Personality

Informed Consent for Survey

8/4/2017

Dr. Victor Law and Reiner Martens, from the [Organization, Information & Learning Science Department](#) are conducting a research study. The purpose of the research is to analyze the relationship between leadership style and respectful leadership, innovative work behavior, and pro-active personality. You are being asked to participate in this study because you are identified by one of your co-workers as a possible informed contributor to answer the research questions. If you are younger than 18 years, please do not answer this survey.

Your participation will involve [answering one survey](#). The [survey](#) should take about **25** minutes to complete. The [survey](#) includes questions such as

The Person I Am Rating. . .

- Provides me with assistance in exchange for my efforts
- Talks optimistically about the future

Your involvement in the study is voluntary, and you may choose not to participate. You can refuse to answer any of the questions at any time. There are names or identifying information associated with your responses, but only the researcher will have access to this data and will treat the same confidential. There are no known risks in this study, but some individuals may experience discomfort or loss of privacy when answering questions. Data will be anonymized before it will be analyzed. The data itself will be stored on password protected laptops or encrypted USB memory sticks.

The findings from this project will provide information on how leadership style influences the success of organizations. If published, results will be presented in summary form only.

If you have any questions about this research project, please feel free to call [Dr. Law or Mr. Martens](#) at 001 505 277 1434. If you have questions regarding your rights as a research subject, or about what you should do in case of any harm to you, or if you want to obtain information or offer input you may call the UNM Office of the IRB (OIRB) at (505) 277-2644 or irb.unm.edu.

By clicking the appropriate box you will be agreeing to participate in the above described research study.

Einverständniserklärung für die Umfrage

8/4/2017

Dr. Victor Law und Reiner Martens von der Universitätsabteilung Organization, Information & Learning Science Department der Universität New Mexico führen ein Forschungsprojekt durch. Das Ziel der Forschung ist es, die Beziehung zwischen Führungsstil und respektvoller Führung, innovatives Arbeitsverhalten und pro-aktives Personal zu analysieren. Sie werden gebeten, an dieser Studie teilzunehmen, weil Sie von einem Kollegen identifiziert worden sind, um möglicherweise durch Ihren Beitrag diese Frage zu beantworten. Wenn Sie jünger als 18 Jahre alt sind, bitte beantworten Sie diese Umfrage nicht.

Ihre Beteiligung wird in form eines Fragebogens sein. Der Fragebogen sollte ungefähr in 25 Minuten zu beantworten sein. Die Umfrage enthält Frage wie

Die Person, die ich bewerte

- Gibt mir genügend Hilfe im Tausch für meine Anstrengungen
- Spricht optimistisch über die Zukunft

Ihre Beteiligung in der Studie ist freiwillig und Sie können entscheiden, sich nicht zu beteiligen. Sie können es jederzeit ablehnen, eine Frage zu beantworten. Namen und identifizierende Informationen sind mit Ihren Antworten assoziiert, aber nur die Forscher werden Zugang zu diesen Daten erhalten und werden diese absolut vertraulich behandeln. Es sind keine Risiken in Zusammenhang mit dieser Forschung bekannt, aber einige Teilnehmer werden sich vielleicht unwohl oder einen Verlust der Privatsphäre fühlen, während der Beantwortung der Fragen. Die Daten werden anonym gemacht bevor die Daten analysiert werden. Die Daten selbst werden auf einem mit einem Passwort geschützten Laptop gespeichert oder eine USB stick, welcher ausschliesslich verschlüsselte Daten enthalten wird.

Das Resultat dieses Forschungsprojektes werden Informationen über den Einfluß des Führungsstils auf den Erfolg einer Organization geben. Wenn diese Informationen veröffentlicht werden sollten, werden diese nur summarativ präsentiert.

Wenn Sie irgendeine Frage über dieses Forschungsprojekt haben, bitte kontaktieren Sie Dr. Law oder Herrn Martens telefonisch erreichbar unter 001 505 277 1434. Wenn Sie Fragen über Ihre Rechte als Forschungssubjekt haben oder was Sie machen können falls Ihnen einen Schaden entsteht oder Sie Feedback geben wollen, bitte wenden Sie sich an die Universität New Mexico, Abteilung Internal Review Board unter 001 505 277 2655 oder irb.unm.edu.

Wenn Sie die entsprechende Box anklicken, willigen Sie ein, an dem oben beschriebenen Forschungsprojekt teilzunehmen.

The translation of the informed consent into German was conducted by Reiner Martens, who is a legal citizen of Germany, born and raised there as educated in Germany up to a Master Degree in Engineering.

La relación entre tipo de liderazgo y liderazgo respetuoso, desempeño innovador y personalidad proactiva

Informe y beneplácito para tomar la encuesta

4 de Agosto 2017

El Dr. Victor Law y el Sr. Reiner Martens, del departamento de estudios de organización, información y aprendizaje, están llevando a cabo un estudio de investigación científica (sociología?). El propósito de esta investigación es de analizar la relación entre el estilo de liderazgo de una persona y liderazgo respetuoso, conducta innovadora de trabajo y una personalidad proactiva. Se te está pidiendo que tu participes en este estudio porque fuiste identificado por uno de tus compañeros de trabajo como una persona que podría contribuir de una manera informada a estas preguntas de la investigación. Si eres menor de 18 a favor de no tomar parte de esta encuesta.

Tu participación requiere que respondas a varias preguntas en una encuesta y esperamos que solo se tome 25 minutos para completar. La encuesta tiene preguntas como las siguientes:

La persona que estoy calificando...

- Me proporciona asistencia a cambio de mis esfuerzos? (Me ayuda a desempeñar mis tareas)
- Tiene un punto de vista optimista sobre el futuro

To participación en esta encuesta es completamente voluntario y si tu quieres puedes elegir que no participaras en esta encuesta. Por cualquier razón y a cualquier hora puedes negarte a contestar a cualquier pregunta. Tu nombre y otra información que te pueda identificar estará vinculada a tus respuestas, pero solo el investigador a cargo de la encuesta tendrá acceso a esta información y la mantendrá de manera confidencial. No

se conoce que este estudio traiga algún riesgo, pero es posible que algunos individuos se puedan sentir incómodos, o que están perdiendo su privacidad, al contestar las preguntas de la encuesta. Las respuestas serán anonimizadas antes de que estas sean analizadas. Las encuestas ya terminadas serán conservadas en un dispositivo o llavero cifrado de memoria portátil (USB STICK) y en una computadora portátil (laptop) protegida por contraseña.

Esperamos que los resultados de esta investigación nos proporcionen más conocimientos sobre como el estilo de liderazgo de una persona influye al éxito de la organización. Si los resultados llegan a ser publicados, estos serán presentados solamente en forma sumaria.

Si tienes alguna pregunta sobre este estudio de investigación, favor de comunicarse con el Dr. Law o el Sr. Martens al 001 505 277 1434. Si tienes alguna pregunta con respecto a tus derechos como un sujeto de este estudio o que debes hacer en caso de que este estudio te cause algún daño, o si quieres obtener mas información o proporcionar alguna retroalimentación, puedes llamar a las oficinas de la Mesa de Evaluacion Institucional (IRB) de la Universidad de Nuevo Mexico al 505-277-2644 o mandar un correo electrónico a irb.unm.edu

Al hacer clic en la sección o caja marcada tu indicas que estas de acuerdo en participar en este estudio de investigación.

The translation of the informed consent into Spanish was conducted by Reiner Martens, who passed “La Prueba” Spanish Exam for bilingual education and lived 10 years in Mexico. The translation was reviewed by Dr. Salvador Portillo, Spanish speaker, and Research Professor at UNM.

REFERENCES

- Abolhassani, A., Layfield, K., & Gopalakrishnan, B. (2016). Lean and US manufacturing industry: popularity of practices and implementation barriers. *International Journal of Productivity & Performance Management*, 65(7), 875–897.
- Adrian, N. (2011). A lean transformation. *Quality Progress*, 44(2), 40–45.
- Aepfel, T. (2011). For lean factories, no buffer. *The Wall Street Journal*, 257(99), B1-99.
- Aij, K. H., Visse, M., & Widdershoven, G. A. M. (2015). Lean leadership: an ethnographic study. *Leadership in Health Services*, 28(2), 119–134.
- Allen, N. (2010). Lean, mean machine. *Motor Transport*, 22–23.
- Alves, A. C., Dinis-Carvalho, J., & Sousa, R. M. (2012). Lean production as promoter of thinkers to achieve companies' agility. *Learning Organization*, 19(3), 219–237.
- Andel, T. (2013). Do these boxes make me look leaner? *Material Handling & Logistics*, 68(10), 18–21.
- Angelis, J., Conti, R., Cooper, C., & Gill, C. (2011). Building a high-commitment lean culture. *Journal of Manufacturing Technology Management*, 22(5), 569–586.
- Antonakis, J., Avolio, B. J., & Sivasubramaniam, N. (2003). Context and leadership: An examination of the nine-factor full-range leadership theory using the multifactor leadership questionnaire. *The Leadership Quarterly*, 14(3), 261–295.
- Arthur, J. B. (1992). The link between business strategy and industrial relations systems in American steel minimills. *Industrial & Labor Relations Review*, 45(3), 488–506.
- Atkinson, P. E. (2010). “Lean” is a cultural issue. *Management Services*, 54(2), 35–41.
- Atkinson, P. E. (2013). Implementation of lean culture change and continuous improvement. *Operations Management*, 39(3), 16–21.

- Avolio, B. J., & Bass, B. M. (1998). Measures and assessments for the transformational leadership approach. *Leadership: The Multiple-Level Approaches: Contemporary and Alternative*, 24, 75–76.
- Badurdeen, F., & Gregory, B. (2012). The softer side of lean. *Industrial Engineer*, 44(2), 49–53.
- Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly*, 421–458.
- Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory*. Englewood Cliffs, NJ, US: Prentice-Hall, Inc.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52(1), 1–26.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.
- Bashin, S. (2012a). Prominent obstacles to lean. *International Journal of Productivity & Performance Management*, 61(4), 403–425.
- Bashin, S. (2012b). An appropriate change strategy for lean success. *Management Decision*, 50(3), 439–458.
- Bass, B. M. (1985). Leadership: good, better, best. *Organizational Dynamics*, 13(3), 26–40.
- Bass, B. M., & Avolio, B. J. (1993). Transformational Leadership and organizational culture. *Public Administration Quarterly*, (1), 112.
- Bass, B. M., & Bass, R. (2008). *The Bass handbook of leadership: theory, research, and managerial applications*. New York: Free Press.

- Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior*, 14(2), 103–118.
- Bessette, D. (2012). The management processes: Utilizing lean thinking and six sigma technique education in sustainable methods. *Review of Management Innovation & Creativity*, 5(14), 69–73.
- Bhuiyan, N., Baghel, A., & Wilson, J. (2006). A sustainable continuous improvement methodology at an aerospace company. *International Journal of Productivity and Performance Management*, 55(8), 671–687.
- Bhuiyan, N., Baghel, A., & Wilson, J. (2006). A sustainable continuous improvement methodology at an aerospace company. *International Journal of Productivity and Performance Management*, 55(8), 671–687.
- Black, J. R. (2009). Lean manufacturing. *T & P: Tooling & Production*, 75(3/4), 34–35.
- Blader, S., Gartenberg, C., Henderson, R., & Prat, A. (2015). The rReal effects of rRelational cContracts. *American Economic Review*, 105(5), 452–456.
- Bortolotti, T., Boscari, S., & Danese, P. (2015). Successful lean implementation: Organizational culture and soft lean practices. *International Journal of Production Economics*, 160, 182–201.
- Bowers, K. S. (1973). Situationism in psychology: An analysis and a critique. *Psychological Review*, 80(5), 307.
- Brandt, D. (2008). Pipe dreams. *Industrial Engineer: IE*, 40(8), 50–51.

- Brown, D. J., Cober, R. T., Kane, K., Levy, P. E., & Shalhoop, J. (2006). Proactive personality and the successful job search: A field investigation with college graduates. *Journal of Applied Psychology, 91*(3), 717.
- Cameron-Strother, A. H. (2010). Dichotomy of Leadership Impact and Employee Performance in Lean Organizations. *Journal of International Business, 2*(2), 59–72.
- Carmeli, A., Meitar, R., & Weisberg, J. (2006). Self-leadership skills and innovative behavior at work. *International Journal of Manpower, 27*(1), 75–90.
- Carr, L., Lawler, W., & Reny, J. (2012). Rational expense reduction: Lean budgeting at Irving Oil. *Journal of Corporate Accounting & Finance (Wiley), 23*(3), 61–69.
- Carter, B. (2008). Challenges to continuous improvement. *Manufacturers' Monthly, 18–20*.
- Carter, B., Danford, A., Howcroft, D., Richardson, H., Smith, A., & Taylor, P. (2011). Lean and mean in the civil service: The case of processing in HMRC. *Public Money & Management, 31*(2), 115–122.
- Carless, S. A. (1998). Assessing the discriminant validity of transformational leader behavior as measured by the MLQ. *Journal of Occupational and Organizational Psychology, 71*(4), 353–358.
- Chen, Z. X., & Aryee, S. (2007). Delegation and employee work outcomes: An examination of the cultural context of mediating processes in China. *Academy of Management Journal, 50*(1), 226–238.
- Clark, D. (2016). Quality improvement in basic histotechnology: the lean approach. *Virchows Archiv : The European Journal of Pathology, 468*(1), 5–17.

- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge, NY: Taylor & Francis.
- Collins, P. (2010). CSR and ethical issues in operations management. *Global Partnership Management Journal*, 1(1/2), 55–64.
- Corbett, M. (2013). Cold comfort firm: Lean organization and the empirical mirage of the comfort zone. *Culture & Organization*, 19(5), 413–429.
- Crant, J. M. (1995). The proactive personality scale and objective job performance among real estate agents. *Journal of Applied Psychology*, 80(4), 532.
- Crant, J. M. (2000). Proactive behavior in organizations. *Journal of Management*, 26(3), 435–462.
- Creswell, J. W., & Plano Clark, V. L. (2010). *Understanding research: A consumer's guide*. Upper Saddle River, NJ: Merrill.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154–1191.
- Dalal, A. F. (2010). Keep it simple: For lean success, focus on the fundamentals. *Quality Progress*, 43(9), 24–28.
- Davidson, S. (2008). Going lean. *Manufacturing Today*, 8(1), 82–83.
- Davidson, D., & MacKay, K. (2009). Meeting the lean deburring challenge. *Metal Finishing*, 107(5), 18–21.

- Davis, J. W. (2009). *Lean manufacturing: Implementation strategies that work: a roadmap to quick and lasting success*. Beaverton, OR: Industrial Press Inc.
- Dawson, B. (2008). Rubber industry executive of the year. (cover story). *Rubber & Plastics News*, 38(10), 1–19.
- Delisle, R., & Turner, R. (2010). Karl Storz's unconventional intercontinental journey to lean. *Global Business & Organizational Excellence*, 29(6), 6–16.
- Deloitte & Touche. (2002). *The road to world class manufacturing*. Retrieved from <http://www.scribd.com/doc/21544974/UK-Road-to-World-Class-Manufacturing-1>.
- Deluga, R. J. (1998). American presidential proactivity, charismatic leadership, and rated performance. *Leadership Quarterly*, (3), 265.
- Dombrowski, U., & Mielke, T. (2013). *Lean leadership - fundamental principles and their application*. In P. F. Cunha (Ed.), 46th Cirp Conference on Manufacturing Systems 2013 (Vol. 7, pp. 569–574) Amsterdam: Elsevier Science Bv.
- Dombrowski, U., & Mielke, T. (2014). *Lean leadership-15 rules for a sustainable lean implementation*. In H. ElMaraghy (Ed.), Variety Management in Manufacturing: Proceedings of the 47th Cirp Conference on Manufacturing Systems (Vol. 17, pp. 565–570) Amsterdam: Elsevier Science Bv.
- Doss, R., & Orr, C. (2007). Lean leadership in healthcare. *White Paper*.
- Downie, R. S., & Telfer, E. (1969). Respect for persons. *London: George Allen And*.
- Eby, L. T., Butts, M., & Lockwood, A. (2003). Predictors of success in the era of the boundaryless career. *Journal of Organizational Behavior*, 24(6), 689–708.
- Emiliani, M. L. (2008). Standardized work for executive leadership. *Leadership & Organization Development Journal*, 29(1), 24–46.

- Emiliani, B., Stec, D. J., Grasso, L., & Stodder, J. (2003). *Better thinking, better results: Using the power of lean as a total business solution*. Center for Lean Business Management.
- Emiliani, M. L., & Emiliani, M. (2013). Music as a framework to better understand lean leadership. *Leadership & Organization Development Journal*, 34(5), 407–426.
- Epsten, D. B. (2013). Creating value for LEED Projects with lean. *Environmental Design & Construction*, 16(9), 26–28.
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500–507.
- Fauf, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2007). G* Power 3 (Version 3.1.6)[Software].
- Faulkner, B. (2013). Applying lean management principles to the creation of a postpartum hemorrhage care bundle. *Nursing for Women's Health*, 17(5), 400–411.
- Flinchbaugh, J., Carlino, A., & Curtis-Hendley, M. L. (2008). Essentials of lean leadership. *T & P: Tooling & Production*, 74(2), 16–18.
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 382–388.
- Frankena, W. K. (1986). The ethics of respect for persons. *Philosophical Topics*, 14(2), 149–167.
- Fujii, L. A. (2012). Research ethics 101: Dilemmas and responsibilities. *PS: Political Science & Politics*, 45(4), 717-723.
- Garza-Reyes, J. A., Ates, E. M., & Kumar, V. (2015). Measuring lean readiness through the understanding of quality practices in the Turkish automotive suppliers industry. *International Journal of Productivity & Performance Management*, 64(8), 1092–1112.

- Gingerich, K. (2008). What lean is not: A rant. *Design News*, 63(16), 16–16.
- Ginsberg, A., & Venkatraman, N. (1985). Contingency perspectives of organizational strategy: A critical review of the empirical research. *Academy of Management Review*, 10(3), 421–434.
- Glossmann, J.-P., Schliebusch, O., Diehl, V., & Walshe, R. (2000). “Lean Management” im ärztlichen Bereich: Möglichkeiten und Grenzen. *Medizinische Klinik: Das Offizielle Organ Der Deutschen Gesellschaft Für Innere Medizin*, 95(8), 470–473.
- Glover, W. J., Farris, J. A., & Van Aken, E. M. (2015). The relationship between continuous improvement and rapid improvement sustainability. *International Journal of Production Research*, 53(13), 4068–4086.
- Graen, G. B., & Scandura, T. A. (1987). Toward a psychology of dyadic organizing. *Research in Organizational Behavior*, 9, 175.
- Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work. *Research in Organizational Behavior*, 28, 3–34.
- Grunden, N. (2009). Lean at the front line: All hands on deck. *Frontiers of Health Services Management*, 26(1), 33–37.
- Hach, A. B. (2009). Leading the way. *Quality*, 48(9), 48–50.
- Hartwell, J. K., & Roth, G. (2010). Doing more with less at Ariens: A leadership and transformation case study. *Organization Management Journal (Palgrave Macmillan Ltd.)*, 7(2), 89–109.
- Hatch, M. J., & Cunliffe, A. L. (2006). *Organization theory* (1st ed.). Oxford University Press.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.

- Henderson, H. (2008). Lean techniques key to companies' successes. *Manufacturers' Monthly*, 8–8.
- Hillberg, J. (2015). Three levels of continuous improvement. *Lean Management Journal*, 5(9), 23–25.
- Hines, P. (2010). How to create and sustain a lean culture. *Training Journal*, 28–32.
- Hines, P., Holweg, M., & Rich, N. (2004). Learning to evolve: A review of contemporary lean thinking. *International Journal of Operations & Production Management*, 24(10), 994–1011.
- Hirschman, A. O. (1970). *Exit, voice, and loyalty: Responses to decline in firms, organizations, and states* (Vol. 25). Harvard university press.
- Hofstede, G. (2001). *Cultures consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, Calif.: Sage Publication.
- Hogan, B. J. (2009). Sustaining a lean culture. *Manufacturing Engineering*, 143(5), 71–76.
- Höök, M., & Stehn, L. (2008a). Lean principles in industrialized housing production: The need for a cultural change. *Lean Construction Journal*, 20–33.
- Höök, M., & Stehn, L. (2008b). Applicability of lean principles and practices in industrialized housing production. *Construction Management & Economics*, 26(10), 1091–1100.
- Houborg, C. (2010). Implementing a successful lean program: Where do you begin? *Pharmaceutical Technology Europe*, 22(9), 52–57.
- Howell, V. W. (2015). Building long-term success for your lean initiative. *Ceramic Industry*, 165(4), 26–29.
- Imai, M. (1986). *Kaizen: The key to Japan's competitive success*. New York, Itd: McGraw-Hill.

- Janssen, O. (2000). Job demands, perceptions of effort--reward fairness and innovative work behavior. *Journal of Occupational & Organizational Psychology*, 73(3), 287–302.
- Johns, C. (2015). Tips for improving manufacturing practices through lean implementation. *Industrial Maintenance & Plant Operation*, 76(5), 16–17.
- Jones, R., Latham, J., & Betta, M. (2013). Creating the illusion of employee empowerment: lean production in the international automobile industry. *International Journal of Human Resource Management*, 24(8), 1629–1645.
- Jusko, J. (2012). A champion of lean. *Industry Week/IW*, 261(6), 18–22.
- Kahle, D. (2015). Lean thinking and culture. *Smart Business Cleveland*, 26(10), 14–14.
- Kahlen, F.-J., & Patel, Y. (2011). Leaning the supply chain to maximize value delivery to the customer: A case study. *Leadership & Management in Engineering*, 11(2), 128–136.
- Kant, I.(1788): *Grundlegung zur Metaphysik der Sitten*. Hg. v. Bernd Kraft und Dieter Schönecker. Hamburg: Meiner.
- Kavanagh, S., & Cole, J. (2013). Achieving critical mass. *Government Finance Review*, 29(3), 12–20.
- Kenworthy, H. (2013). Getting started with lean government projects. *Government Finance Review*, 29(3), 22–28.
- Kitchenham, B., & Brereton, P. (2013). A systematic review of systematic review process research in software engineering. *Information and Software Technology*, 55(12), 2049–2075.
- Kull, T. J., Yan, T., Liu, Z., & Wacker, J. G. (2014). The moderation of lean manufacturing effectiveness by dimensions of national culture: Testing practice-culture congruence hypotheses. *International Journal of Production Economics*, 153, 1–12.

- Langer, E. (1983). *The psychology of control*. Beverly Hills: Sage Publication.
- Lawell, C. (2010). Finding the cure. *Smart Business Akron/Canton*, 20(3), 22–27.
- Lewin, K. (1938). *The conceptual representation and the measurement of psychological forces*. Duke University Press.
- Li, A. (2008). Shanghai surprise. *Industrial Engineer: IE*, 40(5), 28–32.
- Li, B., Nahm, A. Y., Wyland, R., Ke, J.-Y., & Yan, W. (2015). Reassessing the role of Chinese workers in problem solving: A study of transformational leadership, trust and security in ‘lean’ manufacturing. *Asia Pacific Business Review*, 21(4), 464–481.
- Liker, J., & Convis, G. L. (2011). *The Toyota way to lean leadership: Achieving and sustaining excellence through leadership development*. NY: McGraw-Hill Education.
- Liker, J. K., & Franz, J. K. (2012). The Toyota way: Helping others help themselves. *Manufacturing Engineering*, 149(5), 87–95.
- Liker, J. K., & Hoseus, M. (2010). Human resource development in Toyota culture. *International Journal of Human Resources Development and Management*, 10(1), 34–50.
- Liker, J. K., & Morgan, J. M. (2006). The Toyota way in services: The case of lean product development. *Academy of Management Perspectives*, 20(2), 5–20.
- Littler, C. R., (1978). Understanding Taylorism. *The British Journal of Sociology*, (2), 185.
- Lomax, R. G., & Hahs-Vaughn, D. L. (2013). *An introduction to statistical concepts*. Routledge, NY: Taylor & Francis.
- Ludwig, C. (2014). Leadership, efficiency, analysis & networking. *Automotive Logistics*, 17(3), 44–49.

- MacDuffie, John Paul (1995). Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *Industrial & Labor Relations Review*, 48(2), 197–221.
- McLoughlin, B. (2015). Five questions with Heritage Home CEO Lozyniak. *Furniture/Today*, 39(40), 1–8.
- Mann, D. (2009). The missing link: Lean leadership. *Frontiers of Health Services Management*, 26(1), 15–26.
- Markovitz, D. (2016). The fit organization: How to create a continuous-improvement culture. *Rotman Management*, 18–23.
- Marksberry, P. (2012). A quantitative outlook on Toyota’s replicating efforts for supplier development. *Benchmarking: An International Journal*, 19(2), 277–298.
- Maynes, W., McCall, M., & Kaplan, R. (1985). *Whatever it takes: Decision makers at work*. Englewood Cliffs, NJ: Prentice-Hall.
- McCreary, P. J. (2010). Lean leadership from the shop floor supervisor. *Supervision*, 71(3), 14–16.
- Mehri, D. (2006). The darker side of lean: an insider’s perspective on the realities of the Toyota production system. *The Academy of Management Perspectives*, 20(2), 21–42.
- Miguel, P. A. C., & Carvalho, M. M. de. (2014). Benchmarking six sigma implementation in services companies operating in an emerging economy. *Benchmarking: An International Journal*, 21(1), 62–76.
- Miles, R. E., Snow, C. C., Meyer, A. D., & Coleman, H. J. (1978). Organizational strategy, structure, and process. *Academy of Management Review*, 3(3), 546–562.
- Minter, S. (2015). What leaders should do on the gemba. *Industry Week/IW*, 264(5), 26–26.

- Moss Kanter, R. (1988). When a thousand flowers bloom: Structural, collective and social conditions for innovation in organization. *Research in Organizational Behavior, Eds. Staw BM and Cummings LL, 10*
- Mróz, B. (2010). Psychosocial determinants of the production managers' hierarchy of values in the light of lean manufacturing and positive psychology. *Proceedings of the European Conference on Management, Leadership & Governance, 249–257.*
- Muenjohn, N., & Armstrong, A. (2008). Evaluating the structural validity of the multifactor leadership questionnaire (MLQ), capturing the leadership factors of transformational-transactional leadership. *Contemporary Management Research, 4(1).*
- Muthukumar, N., Tamizhjothi, K., & Nachiappan, R. M. (2014). Link between organizational culture and integrated CI tool - TPLM: A study with reference to Automotive Axles Ltd., Mysore, India. *IUP Journal of Operations Management, 13(4), 31–48.*
- Muthuswamy, V. (2013). Ethical issues in clinical research. *Perspectives in clinical research, 4(1), 9.*
- Myrvold, S. (2011). 7 tips for continuous improvement. *American Printer, 128(7), 9–9.*
- Myszewski, J. M. (2015). No time for quality. *TQM Journal, 27(4), 435–449.*
- Netland, T. H. (2016). Critical success factors for implementing lean production: the effect of contingencies. *International Journal of Production Research, 54(8), 2433–2448.*
- Novac, C., & Mihalcea, A. (2014). The relationship between leadership, organizational culture and managerial culture through Lean strategy in a multinational company. In C. Bratianu, A. Zbucea, F. Pinzaru, & E. M. Vatamanescu (Eds.), *Strategica: Management, Finance, and Ethics* (pp. 349–369). Bucharest: Tritonic Publ House.

- Nunnally, J. C., & Bernstein, I. H. (1978). *Psychometric theory*. New York, NY: McGraw-Hill Book Company.
- Ohno, T. (1982). How the Toyota production system was created. *Japanese Economy*, 10(4), 83–101.
- Patrick, K. (2015). New leadership model focuses on caring, compassion. *Paper 360*, 10(6), 32–33.
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: explanation and prediction*. Fort Worth, Texas: Harcourt Brace College Publishers.
- Petersen, C. (2010). McCain's new edge. *Food & Drink*, 38–42.
- Pittaway, L., Robertson, M., Munir, K., Denyer, D., & Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, 5(3–4), 137–168.
- Poksinska, B., Swartling, D., & Drotz, E. (2013). The daily work of lean leaders – lessons from manufacturing and healthcare. *Total Quality Management & Business Excellence*, 24(7–8), 886–898.
- Rahn, R. D. (2015). What goes around: A fresh look at quality from a lean perspective. *Quality*, 54(9), 51–55.
- Raines, M. S. (2011). Engaging employees. *Professional Safety*, 56(4), 36–43.
- Ramamoorthy, N., Flood, P. C., Slattery, T., & Sardesai, R. (2005). Determinants of innovative work behavior: Development and test of an integrated model. *Creativity and Innovation Management*, 14(2), 142–150.
- Ransom, C. (2007, December). *A wall street view of lean transformation*. Presented at the Lean Enterprise Institute, unknown.

- Robinson, S. T., & Kirsch, J. R. (2015). Lean strategies in the operating room. *Anesthesiology Clinics*, 33(4), 713–730.
- Ross, K. (2014). Not your father's service industry. *Industrial Engineer: IE*, 46(5), 40–44.
- Roth, G. (2006). Distributing leadership practices for lean transformation. *Reflections: The SoL Journal*, 7(2), 15–29.
- Rowold, J., & Heinitz, K. (2007). Transformational and charismatic leadership: Assessing the convergent, divergent and criterion validity of the MLQ and the CKS. *The Leadership Quarterly*, 18(2), 121–133.
- Sarkar, D. (2011). Eight deadly faux pas of continuous improvement. *Performance Improvement*, 50(8), 5–8.
- Schein, E. H. (1985a). Defining organizational culture. *Classics of organization theory*, 3, 490-502.
- Schein, E. H. (1985b). *Organizational culture and leadership*. San Francisco: Jossey-Bass Publishers.
- Schein, E. H. (2010). *Organizational culture and leadership* (Vol. 4th ed). San Francisco: Jossey-Bass.
- Schneider, B. (1982). *Interactional psychology and organizational behavior*. Michigan State University East Lansing Dept of Psychology.
- Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580–607.
- Seibert, S. E., Crant, J. M., & Kraimer, M. L. (1999). Proactive personality and career success. *Journal of Applied Psychology*, 84(3), 416.

- Semiklose, T. (2014). Safety: The sixth “S” in a 5S system. *Plant Engineering*, 68(4), 53–57.
- Settoon, R. P., Bennett, N., & Liden, R. C. (1996). Social exchange in organizations: Perceived organizational support, leader -- member exchange, and employee reciprocity. *Journal of Applied Psychology*, 81(3), 219–227.
- Severs, J. (2010). Integration is the key to lean. *PrintWeek*. Haymarket Business Publications Ltd, 22–23.
- Shiba, G., Graham, A., Walden, D. (1993). *A new American TQM: Four practical revolutions in management*. Cambridge, Mass.: The Institute of **Management** Sciences and the Operations Research Society of America.
- Sim, K. L. & Rogers, J. W. (2009). Implementing lean production systems: Barriers to change. *Management Research News*, 32(1), 37-49.
- Simon, B., & Stürmer, S. (2003). Respect for group members: Intragroup determinants of collective identification and group-serving behavior. *Personality and Social Psychology Bulletin*, 29(2), 183–193.
- Sloan, K. (2011). The path to a sustainable play book. *Industrial Engineer: IE*, 43(4), 41–46.
- Smith, D. R. (2012). “Evolution” panel shares lean learning. *Smart Business Cleveland*, 23, 32–33.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, 13, 290–312.
- Southworth, T. (2012). Gemba walks. *Label & Narrow Web*, 17(2), 38–39.
- Spear, S. J. (2004). Learning to lead at Toyota. *Harvard Business Review*, 82(Part 5), 78–91.

- Spears, R., Ellemers, N., & Doosje, B. (2005). Let me count the ways in which I respect thee: Does competence compensate or compromise lack of liking from the group? *European Journal of Social Psychology*, 35(2), 263–279.
- Staw, B. M., & Boettger, R. D. (1990). Task revision: A neglected form of work performance. *Academy of Management Journal*, 33(3), 534–559.
- Stock, R. M. (2015). Is boreout a threat to frontline employees' innovative work behavior? *Journal of Product Innovation Management*, 32(4), 574–592.
- Spinelli, R. J. (2006). The applicability of Bass's model of transformational, transactional, and laissez-faire leadership in the hospital administrative environment. *Hospital Topics*, 84(2), 11–19.
- Sturdevant, D. (2014). (Still) learning from Toyota. *McKinsey Quarterly*, (2), 106–111.
- Tatham, H. (2008). Case study: Mining the depths - from Australia to Invercargill. *NZ Marketing Magazine*, 27(10), 32–36.
- Taylor, F. W. (1911). *The principles of scientific management*. New York, Harper & Brothers.
- Teresko, J. (2008). Continuing a winning culture. *Industry Week/IW*, 257(1), 42–42.
- Thomas, K. (2016). Turning “who” into “how.” *Quality Progress*, 49(1), 24–24.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222.
- Vago, T., Bell, A. M., & Thompson, H. (2016). Lean delivery. *Quality Progress*, 49(2), 30–35.

- Van Quaquebeke, N., & Eckloff, T. (2010). Defining respectful leadership: What it is, how it can be measured, and another glimpse at what it is related to. *Journal of Business Ethics*, 91(3), 343–358.
- van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *The Academy of Management Review*, 20(3), 510–540.
- Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management Journal*, 40(1), 82–111.
- Weinstein, M. (2014). Continuous improvement at CHG. *Training*, 51(1), 48–50.
- Wester, K. L. (2011). Publishing ethical research: A step-by-step overview. *Journal of Counseling & Development*, 89(3), 301–307.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66(5), 297.
- Wickramasinghe, D., & Wickramasinghe, V. (2012). Effects of perceived organizational support on participation in decision making, affective commitment and job satisfaction in lean production in Sri Lanka. *Journal of Manufacturing Technology Management*, 23(2), 157–177.
- Womack, J. P., Jones, D. T., & Roos, D. (1990). *The machine that changed the world: how Japan's secret weapon in the global auto wars will revolutionize western industry*. New York, NY: Harper Perennial,.
- Wong, A., Tjosvold, D., & Khong, E. (2016). Respectful leadership for managing conflict to cope with market turbulence. In *Asian Businesses in a Turbulent Environment* (pp. 41–62). Springer.

- Wyton, P., & Payne, R. (2014). Exploring the development of competence in lean management through action learning groups: A study of the introduction of lean to a facilities management function. *Action Learning: Research & Practice*, *11*(1), 42–61.
- Yang, F., & Chau, R. (2016). Proactive personality and career success. *Journal of Managerial Psychology*, *31*(2), 467–482.
- Yin, R. K. (1994). *Case study research: Design and methods*, London: Sage Publications.
- Zarbo RJ. (2012). Creating and sustaining a lean culture of continuous process improvement. *American Journal of Clinical Pathology*, *138*(3), 321–326.
- Zhou, L., & Shi, J. (2009). Psychometric properties of the Chinese translation of the proactive personality scale. *Psychological Reports*, *105*(1), 43–56.