Walden University

College of Management and Human Potential

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Terrence Carter

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Walden University
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Abstract

The Role of Leadership Style on Technostress and Job Satisfaction

by

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MPhil, Walden University, 2021

MS, Walden University, 2012

MBA, American InterContinental University, 2005

BS, Mississippi State University, 2003

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Leadership & Organizational Change

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Abstract

The study examined if the technostress of information and communication technologies (ICT) employees determines job satisfaction based on the moderating impact of leadership styles within full-range leadership theory (FRLT). The theoretical framework was grounded in FRLT by Bass and Avolio. Three research questions examined how technostress determined employee job satisfaction among ICT employees, to what extent leadership styles determine employee job satisfaction among ICT employees, and the relationship between technostress and ICT employee job satisfaction. A quantitative nonexperimental research design was used to examine if the technostress of ICT employees determined job satisfaction based on the moderating impact of leadership styles within FRLT. The study included 116 randomly selected participants within a six-state southern region of the United States working in the ICT who rated their supervisor's leadership style as measured by the MLQ-5X instrument and self-rated their job satisfaction as measured by the Job Satisfaction Survey instrument. The study included multiple linear regression analyses in determining employee job satisfaction based on technostress and three leadership styles and a moderated regression analysis for determining if leadership styles were a moderator between technostress and employee job satisfaction. The study revealed a positive significant relationship between technostress and employee job satisfaction. Also, the study revealed positive and significant results for employee job satisfaction based on transformational and passive-avoidant leadership styles. The study's results can affect positive social change by increasing knowledge on mitigating technostress and assessing employee job satisfaction based on FRLT styles.

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Dedication

I dedicate this journey to my number one fan, my wife, Dr. Kimberly Carter. You were always in my corner even when I was not, pushing me to improve and do better. I want to say, "I am sorry for the absent days, and without you, this journey would not have been what it was."

I am dedicated to my heartbeats and mini-superheroes, Terrence II and Nick. Thank you for understanding and keeping me tethered to reality during my journey. You were very understanding and worked with Daddy during the process. I know I have family smiling from heaven and proud of me. My friends, thank you for reminding me to have fun and take the time to celebrate my achievements throughout the process. Dr. Terrance West, thank you for always listening to my scholarly thoughts and providing critical feedback. I love you all!

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Chapter 1: Introduction to the Study

Job satisfaction is a critical concern for leaders based on its potential impacts on factors such as employee job performance and productivity (La Torre et al., 2019). Rapidly changing technology within information and communication technologies (ICTs) can positively impact leader and subordinate relationships, such as increased availability, communication, and productivity. Rapidly changing technology could have the same positive impacts of increased availability and communication from an organizational perspective, can negatively impact employees, and induce technology-related stress or technostress (La Torre et al., 2019). The study's topic and purpose are to examine the moderating effects of leadership styles (i.e., transformational, transactional, and passive avoidance) and the relationship between the independent variable (i.e., technostress) and dependent variable (i.e., employee job satisfaction).

The literature implied that the perpetual mode of learning and adapting to rapidly changing technology could determine how employees feel emotionally about their jobs. The study is critical because the literature indicated that technostress and leadership style could determine job satisfaction (Boyer-Davis, 2018; Valldeneu et al., 2021). Leaders who understand how technology-related stress could determine employee job satisfaction based on their leadership style may improve organizational communication and productivity. Based on this negative impact, this study's positive social change implications could explain how leadership style could mitigate technostress among ICT employees and increase job satisfaction.

In Chapter 1, the contents of the study included the background, problem statement, purpose, research questions, and hypotheses. Next, the chapter included the theoretical framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, and significance. The chapter ends with a summary and transitions to the literature in Chapter 2.

Background of the Study

The research included literature on technostress, FRLT styles (i.e., transformational, transactional, and passive avoidant), and job satisfaction. Boyer-Davis (2018) examined the relationship between technostress and leadership style (i.e., transformational, transactional, and laissez-faire leadership). Boyer-Davis reported a negative and nonsignificant relationship between transformational leadership and technostress and significantly positive relationships for transactional and passive-avoidant leadership in technostress. This research was essential to explaining how technostress can affect the strength and direction of correlation for the FRLT model.

Technostress and Job Satisfaction

Current literature included research on the association between technostress and job satisfaction. Califf et al. (2020) investigated the effects of technostress dimensions on job-related outcomes such as job satisfaction. Technostress induced low job satisfaction (Califf et al., 2020). The research provided substantiation of the relationship between technostress and job dissatisfaction. Other researchers, such as Farrish and Edwards (2020), examined technostress as an illness requiring legal accommodations. Farrish and Edwards demonstrated no legal precedent for US companies to accommodate workers

with technostress, as identified in the Americans with Disabilities Act. This research indicated that having adequate leadership policies could prevent negative consequences of excessive technostress and employee-related consequences like high job dissatisfaction.

Previous researchers indicated a significant theme of job dissatisfaction when employees incur technostress. Ho-Jin and Cho (2016) extended the research by examining the influence of technostress (i.e., predictor variable) on job satisfaction (i.e., dependent variable). Ho-Jin and Cho indicated that increased levels of technostress had a negative correlation with job satisfaction. The research helped explain the association between technostress and job satisfaction, but it does not explain the influence of management styles on job satisfaction.

Kumar et al. (2017) examined the relationship between technostress and job satisfaction, performance, and mental health. Kumar et al. indicated that technostress negatively correlated with job satisfaction. The research helped explain the magnitude and direction of the association between technostress and job satisfaction. Yin et al. (2018) studied the effects of information overload from employee use of mobile information and communication technologies (MICTs). The results indicated that information overload increased technostress and decreased employee job satisfaction (Yin et al., 2018). This study is critical to the current research because it may help determine the association between technostress and job satisfaction.

La Torre et al. (2019) compiled current technostress research from transactional, biological, and occupational stress perspectives and systematically reviewed the

symptoms and risks of technostress in ICT. La Torre et al. indicated that technostress could decrease job satisfaction. The research helped explain the association between technostress and job satisfaction.

Leadership Styles and Job Satisfaction

Current literature included substantial investigation on the association between leadership styles and job satisfaction but not related to ICT employees' technostress. DeLay and Clark (2020) investigated the relationship between the perceived leadership styles of managers and employee job satisfaction. DeLay and Clark's showed how transformational and transactional leadership dimensions positively correlated with employee job satisfaction, while laissez-faire leadership negatively correlated with job satisfaction. DeLay and Clark explained the association between leadership styles and job satisfaction levels but did not explain technostress.

Mufti et al. (2020) examined the impact of leadership style (i.e., transformational and transactional leadership) on job satisfaction with an intervening variable. Mufti et al. showed significant positive associations between leadership style and job satisfaction. The research helped explain a framework with transformational, transactional leadership, and job satisfaction with an intervening variable, but it needs to explain technostress.

Valldeneu et al. (2021) examined the relationship between leadership styles and organizational outcomes (i.e., effectiveness, job satisfaction, and extra effort) from a leadership perspective. The researchers reported that transformational leadership had a significantly positive relationship with job satisfaction as a dependent variable, transactional leadership had no statistical significance with the organizational outcomes,

and passive-avoidant leadership had a significantly negative relationship with job

satisfaction as a dependent variable (Valldeneu et al., 2021). This research is essential to

explaining how leadership style affects organizational outcomes such as job satisfaction.

Likewise, Visvanathan et al. (2018) explored leadership style (i.e.,

transformational and transactional leadership) as a predictor variable of job satisfaction as

an outcome variable. The researchers indicated that transformational and transactional

leadership significantly and positively impact employee job satisfaction (Visvanathan et

al., 2018). The research could help explain the association between leadership styles and

job satisfaction, but it does not examine the indirect impact of technostress between

leadership styles and job satisfaction. Leadership styles are essential to current employees

and their employee-related attitudes (Itzkovich et al., 2020). Moreover, technostress is

another critical topic affecting current ICT employees and their work-related outcomes,

such as job satisfaction (Tarafdar et al., 2019).

This research contributed to current studies on the technostress of ICT employees

and job satisfaction. This study filled the knowledge gap and expanded previous literature

on ICT employees who suffer from technostress due to rapidly changing technology and

incur decreased job satisfaction based on different leadership styles.

Problem Statement

Rapid changing technology in ICTs can create a stressful environment for

employees that utilize ICT within the United States (Boyer-Davis, 2018). Boyer-Davis

(2018) indicated that the global community would exceed over 200 billion networking

devices by 2020. This research suggested that smartphones and computers are prevalent

in homes and workplaces. From a workplace perspective, Boyer-Davis espoused that rapidly changing technology can negatively impact employee-related outcomes triggered by technological stress (Boyer-Davis, 2018).

Boyer-Davis (2018) indicated that technostress contributed more than $300 billion in annual employee-related costs based on employee outcomes such as burnout and turnover intention in U.S. organizations. These impacts show that changing technology affects how leaders interact with their followers to complete work tasks. Farrish and Edwards (2020) found that 40% of U.S. managers believe technostress overwhelms employees and harms job satisfaction. Visvanathan et al. (2018) indicated that leadership style could affect job satisfaction and cause employees to feel overworked and overloaded by leadership expectations. Previous researchers established significant relationships between technostress and leadership style (Boyer-Davis, 2018) and job satisfaction (Al-Ansari & Alshare, 2019) among ICT employees; however, a gap exists in the literature regarding the influence of leadership style based on the relationship between technostress and job satisfaction among employees within one study. The specific management problem was that the relationship between technostress and employee job satisfaction based on FRLT needs to be better understood (Boyer-Davis, 2018; La Torre et al., 2019).

Purpose of the Study

I examined whether the target population for this study is employees who utilize ICT to complete their daily assigned tasks within the U.S. The predictor variable is the technostress (Tarafdar et al., 2007). The moderating variables are transformational,

transactional, and laissez-faire leadership styles within the FRLT model (Bass & Avolio, 2004). The outcome variable is the employee's job satisfaction (Spector, 1985a). The study design consisted of online data collection from ICT employees from the Qualtrics pool of research participants. The study could help policymakers to discern mitigating factors that may minimize the technostress of employees in ICT and how different leadership styles determine their job satisfaction.

Research Questions and Hypotheses

RQ1: To what extent does technostress determine employee job satisfaction among ICT employees?

H_01_1: Technostress has no significant negative impact on ICT employee job satisfaction.

H_11_1: Technostress has a significant negative impact on ICT employee job satisfaction.

H_01_2: Technostress has no significant positive impact on ICT employee job satisfac*tion.*

H_11_2: Technostress has a significant positive impact on ICT employee job satisfaction.

RQ2: To what extent do leadership styles determine employee job satisfaction among ICT employees?

H_02_1: Transformational leadership has no significant positive impact on ICT employee job satisfaction.

$H_1 2_1$: Transformational leadership has a significant positive impact on ICT employee job satisfaction.

$H_0 2_2$: Transformational leadership has no significant negative impact on ICT employee job satisfaction.

$H_1 2_2$: Transformational leadership has significant negative impacts on ICT employee job satisfaction.

$H_0 2_3$: Transactional leadership has no significant negative impacts on ICT employee job satisfaction.

$H_1 2_3$: Transactional leadership has a significant negative impact on ICT employee job satisfaction.

$H_0 2_4$: Transactional leadership has no significant positive impact on ICT employee job satisfaction.

$H_1 2_4$: Transactional leadership has a significant positive impact on ICT employee job satisfaction.

$H_0 2_5$: Laissez-faire leadership has no significant negative impact on ICT employee job satisfaction.

$H_1 2_5$: Laissez-faire leadership has a significant negative impact on ICT employee job satisfaction.

$H_0 2_6$: Laissez-faire leadership has no significant positive impact on ICT employee job satisfaction.

$H_1 2_6$: Laissez-faire leadership has a significant positive impact on ICT employee job satisfaction.

RQ3: As the correlation of leadership style increases, to what extent does the relationship between technostress and ICT employee job satisfaction increase or decrease?

H_03_1: As the correlation of transformational leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.

H_13_1: As the correlation of transformational leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.

H_03_2: As the correlation of transactional leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.

H_13_2: As the correlation of transactional leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.

H_03_3: As the correlation of laissez-faire leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction will increase.

H_13_3: As the correlation of laissez-faire leadership increases, the negative relationship between technostress and ICT employee job satisfaction will increase.

Theoretical Foundation

The theory that grounds this study included Bass and Avolio's (2004) FRLT. The logical connections between the framework presented and the nature of my study include Bass and Avolio's theoretical work, which has been used extensively in leadership style models. The FRLT model has nine factors encompassing transformational, transactional,

and laissez-faire (i.e., passive avoidant) leadership styles (Bass & Avolio, 2004). Transformational leadership includes five factors: idealized attributes, idealized behaviors, individualized consideration, intellectual stimulation, and inspirational motivation (Bass & Avolio, 2004).

Bass and Avolio (2004) espoused that transactional leadership has contingent rewards and active management-by-exception, and passive avoidant leadership has two factors: passive management-by-exception and laissez-faire. Bass and Avolio provided a 45-item instrument (i.e., MLQ-5X form) delineating how employees rate associated leadership styles within the FRLT model.

The research problem of this study addressed how very little or no literature exists regarding the influence of leadership style on the relationship between technostress and job satisfaction among employees (Bass & Avolio, 2004; Spector, 1985a; Tarafdar et al., 2007). The independent variable, technostress, had five factors: techno-invasion, techno-complexity, techno-insecurity, techno-uncertainty, and techno-overload (Tarafdar et al., 2007). Boyer-Davis (2018) authored the first empirical research examining the relationship between leadership styles within the FRLT model and technostress. The empirical research implied that associated leadership styles with the FRLT model could influence employee technostress using information communication technologies (Boyer-Davis, 2018). This research established an association between types of FRLT styles and technostress.

The dependent variable, job satisfaction, had nine factors: pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature

of work, and communication (Spector, 1985a). While FRLT styles were associated with

the technostress of employees, the FRLT model was also associated with job satisfaction

(DeLay & Clark, 2020; Mufti et al., 2020; Visvanathan et al., 2018). The empirical

research implies that a supervisor's leadership style could impact employee job

satisfaction. This research established an association between FRLT types and employee

job satisfaction. I examined if technostress predicts job satisfaction based on the

moderating impact of leadership styles within the FRLT theory (Bass & Avolio, 2004;

Spector, 1985a; Tarafdar et al., 2007). The nature of the study implied a quantitative

research methodology. A comprehensive approach in Chapter 2 provided details on the

consequences of FRLT based on the influence of the independent variable (i.e.,

technostress) and dependent variable (i.e., job satisfaction).

Nature of the Study

The specific research design of this quantitative study included a nonexperimental

correlational approach with ratings of FRLT as a moderating variable between the

independent and dependent variables. The quantitative analysis examined relationships

between leadership styles, technostress, and job satisfaction without manipulation

(Burkholder et al., 2016). I needed to request primary data from Qualtrics, a third-party

surveying tool for my planned research design. The survey included three research

instruments to assess technostress, leadership style, and job satisfaction and collect data

from ICT employees (Bass & Avolio, 2004; Spector, 1985a; Tarafdar et al., 2007). The

technostress creators' instrument included 23 items (Tarafdar et al., 2007). The leadership

style instrument included the Multifactor Leadership Questionnaire (MLQ)-5X rater form

that consisted of 45 items (Bass & Avolio, 2004). The job satisfaction instrument included 36 items (Spector, 1985a). The technostress creators' instrument included 23 items, and the job satisfaction instrument included 36 items that collected data from ICT employees for research question 1 (Spector, 1985a; Tarafdar et al., 2007). The MLQ-5X survey for the leadership style variable and the Job Satisfaction Survey (JSS) instrument for the job satisfaction variable provided data from ICT employees for research question 2 (Bass & Avolio, 2004; Spector, 1985a). The technostress, leadership style, and job satisfaction instruments provided data from ICT employees for research question 3 (Bass & Avolio, 2004; Spector, 1985a; Tarafdar et al., 2007).

This data collection process included survey responses from ICT employees to sustain their employment in their associated workplace. Qualtrics randomly selected participants based on inclusion and exclusion criteria that answered the research questions. The target population included non-management employees who utilize ICT and identify as a subordinate to a leader in the United States. The sample included employees in nonmanagement roles who use ICT and classify themselves as subordinates in Mississippi, Louisiana, Arkansas, Alabama, Georgia, and Tennessee. The sample inclusion criteria for participants included (a) part-time or full-time employment status, (b) at least 3 years of employment, and (c) identification as a nonmanagement employee who utilizes ICT. The questionnaire collected demographical characteristics such as age, gender, ethnicity, annual income, education, and occupation. The a priori power analysis parameters in the F family of tests for multiple linear regression included a 95% confidence interval and a medium effect size (i.e., $f_2 = 0.15$; Faul et al., 2009). Based on

G*Power software (version 3.1.9.4), the minimum sample size for three predictor variables was 107 participants (Faul et al., 2009). The technostress creators' and job satisfaction survey (JSS) instrument provided data points to answer research question 1 (Spector, 1985a; Tarafdar et al., 2007). The MLQ-5X rater survey and JSS instrument provided data points for research question 2 (Bass & Avolio, 2004; Spector, 1985a). The technostress creators' instrument, MLQ-5X rater survey, and JSS scale provided data points for research question 3 (Bass & Avolio, 2004; Spector, 1985a; Tarafdar et al., 2007). The data analysis method included a correlation analysis and multiple linear regression analysis to test the hypotheses for research question 1. The data analysis method included a multiple linear regression (MLR) to test the hypotheses for research question 2. The data analysis method included a moderated regression to test the hypotheses for research question 3.

Definitions

This section defines the predictor variable, FRLT, as a moderating variable and the outcome variable. The following operational terms within the study are as follows:

FRLT styles: FRLT included transformational, transactional, and passive-avoidant leadership styles in Bass and Avolio's (2004) FRLT model (Mufti et al., 2020; Valldeneu et al., 2021).

Information and Communication Technologies (ICT): Torres (2021) indicated that ICT included hardware and software applications that enable personnel to communicate and transfer information within an organization.

Job satisfaction: Mufti et al. (2020) stated that job satisfaction refers to positive feelings, while job dissatisfaction relates to negative feelings toward a job.

Passive-Avoidant or Laissez-faire leadership style: Barnett (2019) stated that laissez-faire leadership is the third dimension of Bass and Avolio's (1995) FRLT theory model and represents an absence of leadership style and avoidance of leading other individuals.

Techno-complexity: Techno-complexity is a dimension of the technostress creators' model in which employees who use ICT devices find it difficult to complete work tasks due to the complexity of associated software and hardware aspects of ICT devices (Tarafdar et al., 2007).

Techno-insecurity: Techno-insecurity is a dimension of the technostress creators' model where employees who use ICT devices feel insecure about keeping their jobs due to rapid changes related to ICT and feel that others are more astute in utilizing ICT (Tarafdar et al., 2007, 2011).

Techno-invasion: Techno-invasion is a dimension of the technostress creators' model that occurs when the employee's use of ICT devices at work invades the personal time away from work (Tarafdar et al., 2007, 2011).

Techno-overload: Techno-overload is a dimension of the technostress creators' model that indicates when an ICT device user becomes overwhelmed based on the amount of information to consume and time constraints (Tarafdar et al., 2007, 2011).

Techno-uncertainty: Techno-uncertainty is a dimension of the technostress creators' model where employees who use ICT devices feel unsettled and uncertain about

the continuous process of upgrading software and hardware aspects of rapid ICT

(Tarafdar et al., 2007, 2011).

Technostress is a stress-related information and communication technology or

ICT (Salanova et al., 2013).

Transactional leadership style: Barnett (2019) stated transformational leadership

was the second dimension of Bass and Avolio's (1995) FRLT theory model and

suggested transformational leaders use extrinsic factors (i.e., rewards and accolades) for

positive reinforcement of organizational goals.

Transformational leadership style: Barnett (2019) and Samanta and Lamprakis

(2018) stated that transformational leadership is the primary and upbeat leadership style

of Bass and Avolio's (1995) FRLT theory model, which goes beyond transactional

leadership and includes five dimensions (i.e., idealized influence, inspirational

motivation, intellectual stimulation, and individualized consideration).

Assumptions

One assumption of the study included that the proposed participants met the

constraints for inclusion and exclusion criteria of the research design. This assumption

was necessary because it would affect the internal and external validity of the study

results. The second assumption was that the instruments in the study were reliable and

valid in measuring technostress, FRLT styles, and job satisfaction. The third assumption

was that the sample would answer the survey questions coherently and honestly.

Scope and Delimitations

The research study focused on employees who use ICT devices through an online survey questionnaire and a purposive non-probability sampling approach. The scope of the study was limited to observing the potential moderating roles of FRLT theory between technostress and job satisfaction. Excluded from this study were the leader's perspectives of their technostress, leadership styles, and job satisfaction. The population included ICT employees, and the excluded population was leaders. The delimitation of this study included employees who use ICT devices to complete their daily work tasks and receive or do not receive either leadership direction via associated ICT devices. The participants who met the inclusion criteria would be the associated population of this study. The potential generalizability of the current research results may have different results from a top-down perspective (i.e., evaluating the moderating role of a supervisor's self-perceived leadership style between perceived employee technostress and employee job satisfaction). I examined a bottom-up relationship (i.e., evaluating the moderating role of FRLT between technostress and employee job satisfaction) of a leader-to-subordinate relationship.

Limitations

The study included several limitations. This study was focused on employees who utilize ICT devices in the United States of America. The selected sample resided in the Southeastern United States. This study's results may limit generalizability to all employees in the United States who utilize ICT devices and may limit the context of the results. ICT employees in various US regions have differing opinions about how

technostress determines job satisfaction. Another limitation was using a nonexperimental research design to respond to the research problem established from the research gap. Second, using an online survey questionnaire included the potential for possible bias based on self-reported data. Third, the combined survey questionnaire may be too long, and participants can provide incomplete or inaccurate responses. The technostress creators' instrument included 23 items (Tarafdar et al., 2007). The leadership style instrument is the Multifactor Leadership Questionnaire (MLQ)-5X rater form included 45 items (Bass & Avolio, 2004). The instrument for job satisfaction included 36 items (Spector, 1985a).

Significance of the Study

This study is significant because it could fill a gap in understanding technostress as a predictor of FRLT and job satisfaction for employees using ICT technologies. Since organizations incorporate advanced technology as a basis for positive social change, it is pertinent for technostress not to inhibit job satisfaction due to leadership style. The results of this study should aid in mitigating technostress among employees based on associated leadership styles. Leaders who utilize ICT devices to push drive leadership agendas could get supplemental training to increase cognizance of the potential moderating role of leadership styles between the relationship between technostress and job satisfaction.

Significance to Theory

I responded to a research gap about FRLT as a moderator for the association between technostress creators' and employee job satisfaction. The leadership styles include transformational, transactional, and laissez-faire within Bass and Avolio's (2004)

FRLT theory (Valldeneu et al., 2021). Valldeneu (2021) indicated that leadership styles could affect job satisfaction. Previous research from Boyer-Davis (2018) showed an association between technostress and the FRLT. However, I assessed the relationship between technostress and FRLT from a leader's perspective. This study showed Boyer-Davis's (2018) theoretical framework to include job satisfaction as an outcome variable from an employee perspective. The research literature showed that increased cognizance of employee outcome variables could help researchers understand if the FRLT model moderates the relationship between technostress and job satisfaction. The study could show the generalizability of the FRLT model in other populations.

Significance to Practice

The study improved the relationships between leaders and subordinates who utilize ICT devices. Boyer-Davis (2018) indicated that technostress contributed more than $300 billion in annual employee-related costs based on employee outcomes such as burnout and turnover intention in US organizations. The literature indicated that technostress contributes to disadvantageous outcomes for ICT employees.

Significance to Social Change

This study contributed to positive social change by providing feedback to organizational leadership on utilizing ICT devices. Stadin's (2020) mitigations of technostress creators could reduce costs for individuals, organizations, and society. The moderating variables of leadership style could help leaders migrate from disadvantageous leadership styles to more effective ones to mitigate technostress and increase employee

job satisfaction. Based on this circumstance, organizations could prevent costly employee outcomes such as job dissatisfaction and turnover.

Summary and Transition

This chapter studied the moderating role of leadership styles in the relationship between technostress and job satisfaction. Chapter 2 reviewed the research literature on employees who use ICTs, technostress, transformational leadership, transactional leadership, laissez-faire leadership, and job satisfaction.

Chapter 2: Literature Review

The specific management problem was that the relationship between technostress and employee job satisfaction based on FRLT remains poorly understood (Boyer-Davis, 2018; La Torre et al., 2019). In this quantitative study, I aimed to assess if the technostress creators of ICT employees determined job satisfaction based on the moderating impact of leadership styles within FRLT. The literature review included the literature search strategy, theoretical foundation, literature review related to critical variables, and a summary and conclusion. Primary variables comprised technostress creators, FRLT, and job satisfaction. The review included previous findings from technostress creators, FRLT theory, and job satisfaction.

Literature Search Strategy

I used Thoreau, EBSCOhost, Business Source Complete and ProQuest Dissertations, ABI/INFORM Collection, Business Complete, Academic Search Complete, Emerald Insight, SAGE Journals, Science Direct, and Dissertations and Thesis @ Walden University in preparing the literature review. The Mind Garden website assessed the FRLT styles and the MLQ-5x rater instrument. The search comprised scholarly articles from peer-reviewed sources using selected phrases and terms. The keywords searched encompassed *leadership styles*, *full-range*, *FRLT theory*, *transformational leadership*, *transactional leadership*, *passive-avoidant*, *laissez-faire leadership, technostress, technostress creators*, *technology stress*, *information and communication technology*, *ICT*, *literature review*, *systematic literature review*, *employee job satisfaction*. The literature search included combinations of search terms. The

combinations of search terms for the moderating and dependent variables included *FRLT*

theory (i.e., transformational, transactional, and passive-avoidant leadership or laissez-

faire leadership) and job satisfaction. The combinations of search terms for the

independent and moderating variables included *technostress creators and FRLT theory.*

The combinations of search terms for the independent and dependent variables included

technostress creators and job satisfaction. The decision criteria for selecting the peer-

reviewed articles for further review included (a) peer-reviewed and scholarly articles

within the last 5 years and (b) retrievable by the researcher through a URL or DOI in a

scholarly database. I reviewed seminal articles outside the last 5 years relating to FRLT,

technostress creators, and employee job satisfaction.

Theoretical Foundation

The theoretical foundation of this study was the FRLT model (Bass & Avolio,

2004). Bass and Avolio's (2004) FRLT included three dimensions: transformational,

transactional, and laissez-faire leadership. The first dimension of Bass and Avolio's

FRLT model was transformational leadership and included four subdimensions (i.e.,

idealized influence, inspirational motivation, intellectual motivation, and individualized

consideration). Itzkovich (2020) showed that the transformational leadership style was

the most effective of Bass and Avolio's FRLT model due to its engagement and

effectiveness with subordinates. The reaction to a transformational leader is satisfactory

based on utilizing a transformational or visionary leadership outlook. The second

dimension of Bass and Avolio's FRLT model was transactional leadership, containing

three subdimensions (contingent reward, active management-by-exception, and passive

management-by-exception). Itzkovich revealed that transactional leadership was less active and influential than transformational leadership.

The third dimension of Bass and Avolio's (2004) FRLT model was laissez-faire leadership. The third dimension of the FRLT model represented an absence of leadership. It indicated that the passive avoidant leadership style was the least effective of Bass and Avolio's FRLT model (Itzkovich et al., 2020). Burns (1978) initiated the concept of transformational leaders based on the transactional leadership qualities of politicians (Bass & Avolio, 2004). The literature depicted that leaders could convert their transactional abilities into transformational characteristics. Bass (1997) expanded the concept of transformational leaders from politicians to non-politicians; Bass and Avolio formed the FRLT model to transformational, transactional, and laissez-faire leadership styles.

Several authors delineated the FRLT model to the association between FRLT and job satisfaction with diverse results. For example, Kebede and Demeke (2017) examined the influence of FRLT styles on employee satisfaction at Ethiopian public universities. Kebede and Demeke showed that transformational leadership positively and significantly influenced employee job satisfaction, while transactional and passive-avoidant leadership were statistically insignificant. Transformational leadership represented the prevailing and most effective approach of the FRLT model. This finding was consistent with previous studies (Saleem, 2015).

Another FRLT observation is the mixed results when researchers assessed transactional and laissez-faire leadership approaches. For example, Barnett (2018)

addressed the relationship between the dimensions of FRLT and employee job satisfaction of online adjunct faculty in the United States. Barnett found that transformational leadership style was a significant positive predictor of job satisfaction, transactional leadership was a significant negative predictor of job satisfaction, and laissez-faire leadership was statistically insignificant. Consistent with previous studies, transformational leadership positively impacted job satisfaction (Mufti et al., 2020; H. Saleem, 2015). Saleem (2015) examined the effect of transformational and transactional leadership on employee job satisfaction, and the researcher observed a positive and significant association between transformational leadership and employee job satisfaction. Like Mufti et al., Saleem Field (2015) found a negative and significant association between transactional leadership and job satisfaction. The research design in Saleem's study did not include a relationship between laissez-faire leadership and job satisfaction.

The reasoning for using the FRLT approach in this study is that different leadership styles could foster dissimilar outlooks among employees in ICT fields. I extended existing research about FRLT by addressing the research gap about the moderating role of leadership style between technostress creators and job satisfaction. This study included technostress creators as an antecedent to Bass and Avolio's (2004) FRLT model and job satisfaction due to different leadership styles. According to Boyer-Davis (2018), different leadership styles within the FRLT could cause ICT leaders to create varying levels of technostress in ICT employees. The research questions in this study build upon the existing FRLT theory based on common antecedents and

consequences of the FRLT model. This study's antecedent of leadership style is technostress creators, while the consequence of leadership style was job satisfaction. Bennet (2009) indicated that leadership styles could influence employee outcomes such as job satisfaction.

Itzkovich (2020) indicated that employees who perceive negative leadership styles could substantially influence employee attitudes. Since Boyer-Davis (2018) extended FRLT research to include leadership styles and technostress creators, it is critical to expand the literature and include how the moderating role of leadership styles affects the relationship between technostress creators and employee job satisfaction. One key observation is that while some researchers apply all the FRLT dimensions within a theoretical framework of various antecedents and outcomes, others do not. Some researchers utilize specific FRLT dimensions and do not apply the entire model to employee job satisfaction. Mufti et al. (2020) examined the impact of transformational and transactional leadership on job satisfaction, and the researchers found significant and positive associations between leadership style and job satisfaction. This research explained the theoretical framework with transformational and transactional leadership styles on job satisfaction. Still, Mufti et al. needed to investigate the relationship between laissez-faire leadership and job satisfaction. The research design from Mufti et al. indicated an example of researchers needing to utilize specific FRLT dimensions or the entire FRLT model within a theoretical framework.

Literature Review Related to Key Variables

Subordinates that use ICT devices have a contradictory dilemma in their ongoing careers in the ICT industry. Previous research on ICT devices indicated how companies had an initial enthusiasm for mobile email devices or smartphones like BlackBerrys and iPhones (Ayyagari et al., 2011). These technological advances fostered the convenience of being cognizant of important workplace tasks. Specific devices with email capability permitted seamless communication with leaders and subordinates regarding workplace projects. Richardson (2017) supported the argument from previous research that companies like Apple and Google simultaneously added convenience and burden to ICT employees and organizations. These devices provided boundless access to coworkers and leaders by allowing instantaneous access.

On the contrary, ICT devices burdened the workforce due to constant access and connecting capabilities. Lee et al. (2014) supported the argument that smartphones have burdensome effects, such as constant access to employees after regular working hours and addiction to checking email before sleeping at night. Boyer-Davis (2018) agreed with previous researchers regarding ICT devices ending a typical eight-hour workday. Lee et al. furthered the research by identifying that smartphones were once technical novelties and later became routine modes of communication to complete tasks. In line with research from Richardson (2017), Nisafani (2020) indicated that ICT employees depend on technology to complete typical workplace tasks. The technostress literature maintained that employees need help utilizing ICT devices.

Technostress Creators

The research showed that technostress might unfavorably affect employees who use ICT devices. The literature showed how the definition of technostress has changed since Brod (1984) first introduced the concept. Brod developed the concept of technostress (i.e., technology stress) as a notion when users cannot positively cope with ICT devices based on continuous use, and he suggested that the inability to cope with ICT devices could cause stress in an individual. Torres (2021) and Stadin et al. (2021) expanded the definition of technostress by Brod as a type of work-related stress. Torres stated that technostress occurs when ICT employees perceive that the use of new technologies exceeds their capability to manage the demands of the new technology. Al-Ansari and Alshare (2019) stated that more technostress research occurred in developed than developing countries. Nonetheless, the technostress definition relates to an imbalance of the proficiency of employees and the stresses of rapidly changing technology.

Technostress Creators' Models

The circumstances from researchers measure technostress remains a contentious matter. Borle et al. (2021) indicated that current technostress research included high heterogeneity among technostress measures. For example, the technostress research included two primary approaches for measuring technostress. The first technostress model by Tarafdar et al. (2007) discussed the creators and inhibitors of technostress. Likewise, Ayyagari et al.'s (2011) second technostress model included technological

characteristics, stressors, and strain. The literature on other technostress measurements besides Tarafdar et al.'s model is limited.

Fischer and Riedl (2017) indicated how multiple technostress measurements could present an external validity concern for understanding the prevalence of technostress in specific populations. Tarafdar (2019) indicated that the technostress creators' construct is derived from the transactional-based model (TBM). The technostress creators' construct included five dimensions: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty (Tarafdar, 2007, 2011). The literature maintained a consistent theme of multiple approaches to discussing stress and strain aspects that could negatively affect employees.

Technostress Creator Dimensions

ICT can manifest strain in employees based on specific technostress creators. Al-Ansari and Alshare (2019) discussed five dimensions that cause technostress, also known as technostress creators, and the dimensions include techno-overload, techno-invasion, techno-uncertainty, techno-complexity, and techno-insecurity. This observation from Al-Ansari and Alshare is consistent with Tarafdar et al.'s (2007) technostress model.

Techno-Overload Dimension

Techno-overload represented the first factor of the technostress creators' model. Murgu et al. (2021) stated that the techno-overload dimension describes multiple streams of information that affect the speed of completing tasks and the volume of ICT workloads. Becker et al. (2021) stated that techno-overload depicts employees working faster and longer due to ICT demands. Al-Ansari and Alshare (2019) indicated that

techno-overload is a stressor due to employees working long hours, often past regularly scheduled hours, to maintain ICT demands. Previous research on technostress showed a negative relationship between techno-overload and outcomes like job satisfaction (Al-Ansari & Alshare, 2019; Ragu-Nathan et al., 2008). Torres (2021) indicated that techno-overload relates to the workload ICT employees experience when receiving more ICT-related work than they can manage. Murgu (2021) indicated that techno-overload occurs when ICT employees simultaneously incur streams of information that force them to work harder than usual to manage ICT demands. Pflügner et al. (2021) stated that techno-overload arises when ICT employees need to work longer and faster due to information systems (IS). Previous technostress research (Ragu-Nathan et al., 2008; Tarafdar et al., 2007, 2011) has consistent definitions that describe the techno-overload dimension of the technostress creators' model.

Techno-Invasion Dimension

Techno-invasion was the second factor of the technostress creators' model. Murgu et al. (2021) indicated that the techno-invasion dimension describes when employees perceive constant connectivity to ICT that invades their personal lives. Becker et al. (2021) stated that techno-invasion depicts when ICT demands cause an employee to blur the availability lines between work and personal time. This circumstance aligned with Stadin's (2020) viewpoint on techno-invasion. Stadin expressed that certain ICT employees expect their leaders to be available indefinitely outside their work schedule. The literature implied that certain expectations to complete assigned tasks from ICT leaders could create stressful situations for ICT employees.

Pflügner et al. (2021) indicated that techno-invasion occurs when employees feel no separation between work and personal life based on constant ICT demands. This interpretation implied that the ICT employees feel their work-life encroaching upon their personal lives. Previous technostress research (Ragu-Nathan et al., 2008; Tarafdar et al., 2007, 2011) has consistent definitions describing the techno-invasion dimension of the technostress creators' model.

Techno-Uncertainty Dimension

Techno-uncertainty was the third factor of the technostress creators' model. Murgu et al. (2021) stated that the techno-invasion dimension describes when employees perceive uncertainty or ambiguity about constant changes to hardware and software for ICT. Becker et al. (2021) stated that techno-uncertainty depicts when employees need clarification about ICT and the proper use of newer technologies in an organization. Pflügner et al. (2021) stated that techno-uncertainty occurs when ICT employees constantly need to adapt and learn new ICT based on the changing ICT systems. Torres (2021) showed that techno-uncertainty occurs when ICT employees are uncertain about ICT use based on constant changes and updates to ICT systems. Hauk et al. (2019) showed that techno-uncertainty creates uncertainty in employees due to the unpredictability of changing ICT. This circumstance depicts how rapidly changing technology could create indecisiveness in ICT employees on when to upgrade specific ICT based on organizational needs.

An example of techno-uncertainty could be when an organization seeks to maintain an ICT capability but needs more decisiveness to change capabilities due to

impending obsolescence. In this situation, the ICT personnel would not want to wait until an ICT becomes obsolete before purchasing a new device that could make a process or product more efficient. The ICT could be new hardware with more processing power or software that makes an organizational process more efficient. Previous technostress research (Ragu-Nathan et al., 2008; Tarafdar et al., 2007, 2011) has consistent definitions that describe the techno-uncertainty dimension of the technostress creators' model.

Techno-Complexity Dimension

Techno-complexity was the fourth dimension of the technostress creators' model. Murgu et al. (2021) stated that the techno-complexity dimension describes when employees perceive ICT work as challenging to comprehend based on its complexity. Becker et al. (2021) stated that techno-complexity depicts employees feeling intimidated by ICT complexity due to a lack of technical skills. Pflügner et al. (2021) indicated that techno-uncertainty arises when employees perceive a lack of skill set based on the complexity of the ICT, and the employee requires more time to understand the nuances of ICT. Torres (2021) indicated that techno-complexity occurs when ICT employees believe it is too difficult to use or understand ICT in the workplace. An example of techno-complexity could occur when employees acquire a new software package to fill a significant gap within an organization. For example, techno-complexity could occur when limited personnel can install, operate, or troubleshoot the newly acquired software based on complexity and schedule constraints. Based on this circumstance, Hauk et al. (2019) explained that techno-complexity implied that employees could feel overwhelmed and incompetent to meet or exceed ICT demands. Previous technostress research (Ragu-

Nathan et al., 2008; Tarafdar et al., 2007, 2011) has consistent definitions that describe

the techno-complexity dimension of the technostress creators' model.

Techno-Insecurity Dimension

The techno-insecurity dimension is the fifth dimension of the technostress

creators' model. Murgu et al. (2021) stated that the techno-insecurity dimension describes

when employees fear losing their jobs or being replaced due to a lack of ICT

understanding. Becker et al. (2021) stated that techno-insecurity depicts when employees

fear being replaced by either new ICT technologies or newer employees. Pflügner et al.

(2021) stated that techno-insecurity happens when employees fear job termination and

replacement by new ICT employees with adept skills or new ICT systems. Torres (2021)

indicated that techno-insecurity occurs when employees fear job insecurity based on ICT

use. Hauk et al. (2019) explained that techno-insecurity could occur when certain

employees feel intimidated by more adept ICT personnel and lack the confidence to

fulfill ICT work tasks and demands from management or peers. Previous technostress

research (Ragu-Nathan et al., 2008; Tarafdar et al., 2007, 2011) has consistent definitions

that describe the techno-insecurity dimension of the technostress creators' model.

Technostress Inhibitors

The technostress inhibitors model included three factors that help mitigate the five

factors in the technostress creators' model. Al-Ansari and Alshare (2019) indicated three

dimensions that inhibit technostress creators, also known as technostress inhibitors. Al-

Ansari and Alshare (2019) stated that the three dimensions include literacy facilitation,

technical support provision, and involvement facilitation. Torres (2021) indicated that

technostress inhibitors mitigate the adverse effects of technostress creators, and the author suggested that one example of an adverse effect of technostress creators is job dissatisfaction. Based on these circumstances, the technostress literature did not suggest that the technostress inhibitors would decrease any potential positive effects of technostress creators. This observation from Al-Ansari and Alshare was consistent with Tarafdar et al.'s (2007) technostress inhibitors model.

Literacy Facilitation Dimension

The technostress inhibitors model has a literacy facilitation dimension that minimizes the effect of factors in the technostress creators' model. Al-Ansari and Alshare (2019) indicated that literacy facilitation describes circumstances that foster the sharing of ICT-related knowledge. Al-Ansari and Alshare showed that literacy facilitation affects technostress creators' relationship with task complexity. Ragu-Nathan et al. (2008) indicated that the literacy facilitation dimension fills gaps between the ICT users' knowledge level and the ICT demands of an organization. For instance, one aspect of literacy facilitation is to provide ICT employees with resources that can aid their understanding of new and upcoming facets of ICT demands and tasks. Based on these enhanced understandings, ICT employees withstand the volatility of rapidly changing technologies in the workplace. Previous technostress inhibitor research (Ragu-Nathan et al., 2008) has consistent definitions that describe the literacy facilitation dimension of the technostress inhibitors model.

Technical Support Provision Dimension

The technostress inhibitors model has a technical support dimension that minimizes the effect of factors in the technostress creators' model. Al-Ansari and Alshare (2019) indicated that the technical support provision describes minimizing technostress by solving an employee's ICT-related problem. Al-Ansari and Alshare (2019) showed that technical support provision indicated how ICT organizations could minimize technostress creators by increasing technical support to ICT employees. Previous technostress inhibitor research (Ragu-Nathan et al., 2008) has consistent definitions that describe the technical support provision dimension of the technostress inhibitors model.

Involvement Facilitation Dimension

The technostress inhibitors model has an involvement facilitation dimension that minimizes the effect of factors in the technostress creators' model. Al-Ansari and Alshare (2019) indicated that involvement facilitation describes minimizing technostress by providing pertinent rationale and intended effects of using new ICT, and the intent is foster employees to experiment with new ICTs. Previous technostress inhibitor research (Ragu-Nathan et al., 2008) has consistent definitions that describe the involvement facilitation dimension of the technostress inhibitors model.

Technostress Approaches

The technostress research included nomenclature and terminology to identify ICT strains and other outcomes. Murgu (2021) indicated that the strain of technostress manifests in three categories: (a) transactional, (b) biological, and (c) occupational health. The technostress approaches relate to the types of strain initiated by technostressors.

Murgu (2021) showed three different approaches to explain the technostress model, and each one implied that it led to adverse outcomes for employees who depend on ICT devices to complete their everyday tasks.

Transactional technostress relates to technostress creators inducing strain on employees based on ICT demands or requests. Murgu (2021) defined the transactional approach to technostress as transactions or events that cause technostress in a work environment. The employee and the ICT transaction occur based on a given situation. For example, the techno-overload factor (Ragu-Nathan et al., 2008) can cause technostress in an employee by trying to assess large amounts of information and meet an urgent deadline. The employee may feel overwhelmed based on a lack of time to complete a given ICT task. The perception of feeling overwhelmed represents strain, and the situation or event represents the stressor. The technostress may decrease as the employee minimizes the assigned ICT tasks.

Biological technostress manifests physical or physiological symptoms in an ICT employee. Soror et al. (2021) indicated burnout as a psychological strain of technostress. In this context, the biological approach is synonymous with the physiological approach. Murgu (2021) defined the biological approach to technostress as elevated circulatory, endocrine, or other physiological responses. In alignment with Murgu (2021), Torres (2021) stated that physiological strain could refer to cardiovascular changes or abnormal hormonal responses. For example, the techno-invasion factor (Ragu-Nathan et al., 2008) can cause technostress in an employee based on continuous calls from coworkers and management about completing a specific assignment within a given schedule. The

constant connectivity could induce anxiety or anger and increase heartbeats and stress hormone levels.

The occupational health approach relates to the transactional approach. Torres (2021) indicated that psychological or physiological approaches could cause strain. For example, occupational technostress could represent ICT employees with techno addiction, techno-strain, fatigue, skepticism, and inefficacy (Atanasoff & Venable, 2017). Previous research from Atanasoff and Venable (2017) had an expanded viewpoint that categorized technostress manifestation into (a) physiological, (b) psychosocial, (c) organizational, and (d) societal problems. Physiological technostress can manifest physical health problems, and psychological technostress can manifest job dissatisfaction or work disengagement (Atanasoff & Venable, 2017). Atanasoff and Venable (2017) indicated that organizational technostress could manifest absenteeism, commitment, and decreased retention; societal technostress can also affect social networks and create financial troubles.

Techno-eustress and Techno-distress

Techno-eustress and techno-distress represent two types of technostress that show a spectrum of optimal and harmful consequences. Based on the transactional stress theory, techno-eustress and techno-distress represent positive and negative perceptions of technostress. Zhao et al. (2020) confirmed this perspective by suggesting that the impact of technostress stress depends on appraisal and coping processes similar to the transactional stress theory. Previous studies, such as Lo (1987), indicated that eustress represented positive stress while distress represented negative stress. Lo (1987) referred

to positive stress as an opportunity and negative stress as a demand. Atanasoff and
Venable (2017) expanded previous research on ICT-related demands by stating them as
psychological and physiological costs to the ICT employee. These findings are consistent
with Califf et al.'s (2020) study on technostress's bright and dark sides in ICT employees.
The bright side of technostress referred to ICT employees who embodied stress as a
challenge. Califf et al. (2020) related challenges to positive stress based on an ICT
employee's positive appraisal of potentially stressful work tasks. Previous research from
Srivastava et al. (2015) suggested that techno-distress occurs when the demand for
assigned job tasks exceeds an ICT employee's capacity or capability to complete them
based on their appraisal.

On the contrary, Califf et al.'s (2020) related hindrance stressors to negative stress
based on an ICT employee's negative appraisal of potentially stressful work tasks. The
dark side of technostress referred to ICT employees who reluctantly accepted tasks based
on perceiving stress as a hindrance. Taser et al. (2022) agreed with the argument about
good and stress and implied that ICT employees could interpret job tasks as positive or
challenging stressors when they could provide career growth. The literature suggested
that ICT employees would be motivated to overcome an associated stressor. Likewise,
Taser et al. (2022) implied that ICT employees could interpret hindering ICT-related
tasks as adversely affecting career growth. The literature suggested that although stress
has a negative connotation, all stress does not necessarily have a negative perception.

Technostress from a Transactional Perspective

The first approach of technostress is a transactional perspective based on transactions or events between a person and an environment. Brod's (1984) initial technostress concept was based on Lazarus and Folkman's (1984) transactional model of stress. Atanasoff and Venable (2017) described technostress as a psychosocial construct that negatively impacts ICT employees.

Nisafani (2020) expanded research from Tarafdar et al. (2007) to state that the technostress construct included four components: causes, strains, inhibitors, and impacts. Research from Torres (2021) aligns with the transactional model of stress in terms of individuals perceiving the demands of an environment as exceeding available, which leads to psychological stress. The literature indicated similar nomenclature to describe the strain on ICT employees. Torres (2021) elaborated that outcomes or consequences of technostress represent a strain on ICT employees. Likewise, Borle (2021) indicated that work outcomes for ICT employees in technostress included work engagement, job satisfaction, individual productivity, and job performance. Borle's (2021) assessment aligned with Torres's (2021) research, which indicated that psychological outcomes for technostress included consequences such as exhaustion or job dissatisfaction. The transactional perspective included discussions about the transactional model of stress, appraisal, and coping processes.

Transactional Model of Stress

The research literature provided a consistent basis for the technostress models. Previous studies showed that Lazarus and Folkman's model included stressors and strain

components of the transactional stress process, and the researchers elaborated that

stressors represent a stimulus or series of events that ICT employees incur based on their

environment (Ayyagari et al., 2011). The transaction-based stress model consisted of

stressors, situational factors, strain, and organizational outcomes (Ragu-Nathan et al.,

2008).

Stressors represent the first component of the transaction-based model of stress.

According to Tarafdar et al. (2007) and Ragu-Nathan et al. (2008), stressors initiate stress

and include demands or events within an associated work environment. These stressors

can be role-related or task-related (Ragu-Nathan et al., 2008). Ragu-Nathan et al. (2008)

indicated that technostress occurred based on (a) heavy dependence on ICT managers, (b)

ICT complexity, and (c) disruption of the traditional workday. Ragu-Nathan et al. (2008)

further explained that role-related stressors included conflict, role overload, or role

ambiguity. For example, ICT employees could perceive a stress creator based on

managers' known or unknown expectations of fulfilling multiple organizational roles and

feeling overwhelmed. Strain represents the second component of the transaction-based

model of stress. Ragu-Nathan et al. (2008) stated that strain is a behavioral,

psychological, and physiological outcome of stress within the transaction-based stress

model. Sarabadani et al. (2018) agreed with Ragu-Nathan et al.'s (2008) extension of the

transaction-based model to the technostress model. Strain included the reaction or

response to a stress creator. Situational factors represent the third component of the

transaction-based model of stress. Ragu-Nathan et al. (2008) indicated that situational

factors could reduce or minimize the impact of stress. In this context, situation factors

include events that moderate the relationship between stress and strain. Nisafani et al. (2020) stated that situational factors are inhibitors, stressors, strains, and outcomes.

The stress model suggests continuous transactions occur between an individual and an associated environment that causes stress (Lazarus & Folkman, 1984). In this context, the literature showed a negative connotation for employees who use ICT devices. The technostress model expanded from the transaction-based model of stress (Lazarus & Folkman, 1984; Tarafdar et al., 2007). Murgu (2021) stated that the transactional approach of technostress included transactions between an ICT employee and an associated work environment. The research literature showed that a buildup of transactions between an individual and an environment occurs over time and induces stress in an individual. The technostress model indicated a direct connection to the transactional model of stress. Tarafdar et al. (2007) investigated the effects of technostress on role stress and individual productivity. Tarafdar et al. (2007) found that technostress and role stress decreased individual productivity and increased role stress in ICT employees. Although the transactional theory of stress provided a critical foundation for the technostress model, the literature provided a dichotomy for interpreting technostress among ICT employees.

Appraisal and Coping Process of Technostress

The literature indicated that an ICT employee's appraisal and coping process of technostress is a crucial determinant of the severity of technostressors. The transactional model stress showed that individuals undergo two appraisal stages that signify sensing and reacting to a stressor (Lazarus & Folkman, 1984). Srivastava et al. (2015) stated that

ICT employees primarily and indirectly appraise potentially stressful ICT-related tasks. Srivastava et al. (2015) suggested that the first appraisal consisted of an ICT employee assessing the task, and the second appraisal (i.e., coping process) included an ICT employee's ability to persevere based on available resources. The researchers implied that the second appraisal is the coping process of technostress based on the ICT employee's reaction.

Technostress from a Biological Perspective

The literature pointed out that the second approach of technostress included a biological perspective. Borle (2021) provided work-related and occupational health outcomes for ICT employees in technostress, but the systematic review needed biological outcomes. It is essential to consider both physiological and physical technostress.

Physiological Manifestations of Technostress

Technostress can affect physiological systems from a biological perspective. Murgu (2021) stated that technostress could reveal physiological strain through physiological markers. Physiological systems include the endocrine, cardiovascular, neurological, and other subsystems. Torres (2021) indicated that physiological reactions (i.e., strain) to stress creators could manifest as abnormal cardiovascular activity or changes in hormone levels. Fischer and Riedl (2017) explained that technostress could manifest by measuring specific biological markers such as cortisol (i.e., the human stress hormone) or identifying cardiovascular responses in ICT employees. Riedl (2012) supported this argument and investigated the effects of technostress on ICT employees from a biological perspective, and the researcher provided research on technostress and

its implications from a neurological perspective. Riedl et al. (2012) supported an association between technostress and cortisol. Atanasoff and Venable (2017) stated that ICTs could increase cardiovascular responses (i.e., heartbeats) and stress hormone production. Jena (2015) and Boyer-Davis (2018) stated that technostress could manifest as physiological changes such as increased cortisol levels from the onset of technostress.

Physical Manifestations of Technostress

Technostress can cause physical ailments that affect the human body from a biological perspective. Boyer-Davis (2018) stated that technostress could manifest as physical changes such as headache, irritability, moodiness, and sleeplessness. Boonjing and Chanvarasuth (2017) indicated that physical manifestations of technostress include strained eye, neck, shoulder, or sleeping problems. Boonjing and Chanvarasuth (2017) investigated the consequences of overusing mobile phones and surveyed 400 workers. Borle et al. (2021) confirmed the association between technostress and physical and physiological manifestations with a systematic literature review that showed how factors within a technostress creators' model are associated with various biological outcomes. Boyer-Davis (2018) stated that technostress could manifest as but is not limited to fatigue, headaches, fear, and depression. These biological conditions show that technostress can negatively alter ICT employees' health. This circumstance contributes to the technostress research from a biological perspective. The literature provided evidence to understand the technostress from a biological perspective.

Technostress from an Occupational Health Perspective

The literature pointed out that the third approach of technostress is relevant to ICT employees from an occupational perspective. It is important to note that technostress can induce from a physical or mental perspective. Previous studies on technostress indicated the occupational health perspective as a central concern for ICT employees (Atanasoff & Venable, 2017). Other researchers agree that occupational health is critical for ICT employees (Murgu, 2021). Borle (2021) indicated that occupational health outcomes for ICT employees included strain, stress, work exhaustion, burnout, and negative emotion (e.g., anxiety). In addition, the literature indicated burnout as a pertinent consequence of technostress. Boyer-Davis (2018) indicated that technostress decreased job burnout among ICT employees. Pflügner et al. (2021) supported previous literature on the effects of technostress creators on job burnout. Based on the technostress construct from Tarafdar et al. (2007), Srivastava et al. (2015) indicated a significant and positive relationship with job burnout. Borle (2021) provided a critical observation about Srivastava et al.'s (2015) research regarding an overall association of technostress creators rather than distinct dimensions. Moreover, Borle (2021) showed that research from Srivastava et al. (2015) represented the only technostress study that included all five dimensions of the technostress creators' construct, while other researchers did not use the entire construct of occupational health outcomes. The literature provided that the occupational health perspective of technostress is relevant to ICT employees.

Antecedents of Technostress

The literature provided consistent themes of antecedents that cause technostress. La Torre (2019) stated that technostress antecedents either influence or increase the effect of technostressors in individuals. Moreover, La Torre (2019) revealed that typical antecedents of technostress include demographical (i.e., age, gender, and education), characteristics of technology, and other job-related factors. Suh and Lee (2017) found that work overload, invasion of privacy, and role ambiguity are three factors that cause technostress and increase strain on ICT employees. Compulsive behaviors in ICT can induce technostress employees. One example is compulsive behaviors or techno-addiction (La Torre et al., 2019), which causes technostress due to the internet and email platforms. Previous research indicated that technostress could manifest as compulsive behaviors in ICT employees (Lee et al., 2014). This circumstance in the literature became apparent as ICT employees continuously check their smartphones for updated information or to understand new workplace issues. Hsaio (2017) substantiated previous research from Lee et al.'s (2014) argument that compulsiveness is an antecedent of technostress. Hsaio (2017) examined the influence of personality traits on the compulsive use of mobile ICT devices and technostress, and the results revealed that certain personality traits contribute to the onset of technostress. The literature revealed that compulsive behavior and personality traits contribute to the onset of technostress as antecedents within research models of stress research. While the literature provided several examples of antecedents that contribute to technostress, the literature provided very little research regarding the relationship between the leadership styles of supervisors

and technostress. Boyer-Davis (2018) provided the sole research article which delineated relationships between technostress and the three dimensions of the FRLT model The literature showed consistent themes of antecedents that cause technostress.

Moderators of Technostress

The literature provided different examples of various research constructs as moderators. La Torre et al. (2019) provided a systematic literature review that revealed technostress's common antecedents, moderators, and consequences. La Torre et al. (2019) termed moderators as inhibitors to technostress and its consequences. This nomenclature was provided by La Torre et al. (2019) aligns with Tarafdar et al.'s (2007) technostress inhibitors model. The research model by Tarafdar et al. (2007) included three dimensions: (a) technical support provision, (b) literacy facilitation, and (c) involvement facilitation. Technostress research shows how age, gender, and education moderators technostress and other outcome variables.

Age

Studies are not consistent regarding the relationship between technostress and age. Borle (2021) stated that the age distribution for technostress could vary based on different occupations. Camarena and Fusi (2022) stated that technostress decreased with age-based ICT experience. On the contrary, Hauk et al. (2019) examined the relationship between chronological age and technology strain based on five technostress creators. It proposed that age positively correlated with technostress creators based on potential cognitive declines in older ICT employees. However, Hauk et al. (2019) showed that age negatively correlated with technostress creators. In the same study, Hauk et al. (2019)

revealed a significant negative correlation between age and technology-related strain. This circumstance shows that age is only partially predictable based on the age of ICT employees. La Torre et al. (2019) stated that age had a statistically significant relationship with technostress creators. This result indicated that participants with higher age had higher levels of technostress. Ragu-Nathan et al. (2008) indicated that technostress decreased as age increased. Thus, older participants experienced less technostress. Tarafdar et al. (2011) indicated that older ICT users have less technostress due to having more ICT experience. Ragu-Nathan et al. (2008) attributed this circumstance that older workers have better stress management skills. This relationship between age and technostress remains inconclusive in various ICT sample populations.

Gender

Technostress has conflicting results when considering gender. Borle (2021) stated that the gender distribution for technostress could vary based on different occupations. La Torre et al. (2019) stated that males have higher stress levels than females, according to Ragu-Nathan et al. (2008), men experienced more technostress than women. Sami and Pangannaiah (2006) indicated that women experience more technostress than men. The technostress research is inconclusive regarding the gender distribution of technostress.

Education

Technostress had a consistent trend regarding education levels. Tarafdar et al. (2019) stated that technostress decreased with higher education levels. Borle (2021) agreed with Tarafdar et al. (2019) regarding the correlation between technostress levels and age. Ragu-Nathan et al. (2008) showed that technostress decreased based on higher

education levels. Sami and Pangannaiah (2006) indicated that education levels influenced technostress levels. The abovementioned research showed that technostress levels could decrease with higher education levels.

Consequences of Technostress

The literature provided consistent themes of consequences caused by technostress. Technostress creators have a direct impact on job-related outcomes for ICT employees. The technostress model's consequences include work-related, behavioral, and health-related outcomes. Nimrod (2018) stated that the consequences of technostress include fatigue, exhaustion, role conflict, performance, productivity (Tarafdar et al., 2007; Tu et al., 2005), and job satisfaction (Al-Ansari & Alshare, 2019; Jena, 2015; Ragu-Nathan et al., 2008). Tu et al. (2005) indicated that technostress could cause organizations to lose productivity and increase employer turnover. For instance, employee productivity was a previously researched consequence of technostress based on its potential detrimental implications to an organization. As technology changes, some ICT employees have increased technostress levels based on the expectation of maintaining or increasing their productivity. Tarafdar et al. (2007) investigated the effects of technostress on role stress and individual productivity. The researchers found that technostress and role stress had a negative and significant relationship with individual productivity, and technostress had a positive and significant relationship with role stress (Tarafdar et al., 2007). The researcher substantiated the critical relationship between technostress and individual productivity for ICT employees. Nonetheless, technostress does not necessarily incur negative consequences.

Technostress and Job Satisfaction

The independent variable, technostress, had a consistently negative and significant impact on the employee outcome – job satisfaction among employees who utilize information communication technology (ICT) devices. Boonjing and Chanvarasuth (2017) was the only research article that provided a significantly positive relationship between technostress and job satisfaction. Sarabadani et al. (2018) and Al-Ansari and Alshare (2019) indicated that job dissatisfaction was a form of strain based on the transactional-based stress model (Ragu-Nathan et al., 2008; Tarafdar et al., 2007). Technostress creators have a direct relationship with strain. Using the transaction-based stress model, ragu-Nathan et al. (2008) investigated the relationship between technostress and job satisfaction. The researchers found that technostress creators decrease job satisfaction in ICT employees. Ragu-Nathan et al. (2008) examined the relationship between technostress creators and job satisfaction. The hypothesis testing revealed that all five technostress creators (i.e., techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty) had a significantly negative association with job satisfaction. Ragu-Nathan et al.'s (2008) results are consistent with other studies regarding the association between technostress and job satisfaction (Al-Ansari & Alshare, 2019; Florkowski, 2019; Jena, 2015; Kumar et al., 2017; Tarafdar et al., 2011). The technostress research showed that technostress and job satisfaction consistently and significantly negatively impacted ICT employees.

The relationship between technostress creators and job satisfaction correlated outside the United States. Al-Ansari and Alshare (2019) investigated the relationship

between technostress creators and job satisfaction, and the hypothesis test between

technostress and job satisfaction indicated a significantly negative (B = -0.25, p < 0.01)

association. The Qatar ICT users' sample included 401 participants (Al-Ansari & Alshare,

2019). One strength of the research was the detailed data analysis between each

technostress creator dimension and the job satisfaction construct. Moreover, the

researchers tested the relationship between all five technostress creator factors with job

satisfaction. The study revealed consistent findings with previous seminal technostress

articles (Jena, 2015; Ragu-Nathan et al., 2008). The abovementioned research showed

that technostress had a consistent relationship with job satisfaction. Florkowski (2019)

examined the relationship between technostress and job satisfaction, and the hypothesis

test revealed that techno-insecurity had a significantly negative association (β = -0.27, p <

0.01) with job satisfaction. However, it is essential to note that the research article only

included the techno-insecurity dimension from Tarafdar's technostress model

(Florkowski, 2019; Tarafdar et al., 2007). The magnitude and direction of the remaining

technostress creator dimensions remain unknown. The study revealed consistent findings

with previous seminal technostress articles (Jena, 2015; Ragu-Nathan et al., 2008).

Boonjing and Chanvarasuth (2017) examined the relationship between technostress and

job satisfaction. The hypothesis testing revealed a significantly positive (β = 0.458;

adjusted R^2 = .207) relationship between technostress and job satisfaction. The sample

population included 346 random participants who were mobile phone users rather than

ICT employees. This research represented the only article with a significantly positive

impact on job satisfaction; however, the sample does not explicitly relate to ICT

employees. Kumar et al. (2017) researched the relationship between technostress dimensions and job satisfaction, and the results ($r = -0.255$, $p < 0.01$) indicated a significantly negative association between technostress and job satisfaction. The sample size of ICT users included 149 information technology (IT) professionals from India. The magnitude and direction of associated technostress creator dimensions were unknown. Jena (2015) researched an association between technostress and job satisfaction, and the data analysis yielded a significantly negative result. The sample population included ICT users who were university professors in India, with a sample size of 350 participants (Jena, 2015). One strength of the research article was the detailed data analysis between each technostress creator dimension and the job satisfaction construct. Moreover, the researcher tested the relationship between all five technostress creator factors with job satisfaction. The study revealed consistent findings with previous seminal technostress research (Ragu-Nathan et al., 2008). Tarafdar et al. (2011) examined the relationship between technostress and job satisfaction, and the hypothesis test between technostress and job satisfaction was significantly negative ($B = -0.351$, $p < 0.01$). The sample population included ICT users who were information systems (IS) users (Tarafdar et al., 2011). One strength of this research was the utilization of concise verbiage to simplify each technostress creator dimension. One concern for this research article was the need for more shown data analysis between each technostress creator dimension and the job satisfaction construct. Based on this circumstance, the magnitudes of technostress factor coefficients were unknown. The study revealed consistent findings with previous seminal technostress research (Ragu-Nathan et al., 2008). Other researchers provided a

relationship between technostress and job satisfaction. Yin et al. (2018) studied the effects of information overload from employee use of mobile information and communication technologies (MICTs). The results showed that information overload increased technostress and decreased employee job satisfaction (Yin et al., 2018). Suh and Lee (2017) created a model that depicted the influence of teleworkers' technostress on job satisfaction, and the results demonstrated that both technology demands and job characteristics could minimize job satisfaction. All the researchers showed that technostress showed a significant and negative relationship with job satisfaction. This research is essential to the current study because it explains a consistent relationship between technostress and job satisfaction.

Techno-Overload Dimension and Job Satisfaction

The relationship between the techno-overload dimension and job satisfaction showed significantly negative relationships consistently. Al-Ansari and Alshare (2019) investigated the relationship between techno-overload (5 items; $\alpha = 0.82$) and job satisfaction ($\alpha = 0.74$). Al-Ansari and Alshare (2019) showed that techno-overload was negatively significant in predicting job satisfaction. The study revealed consistent findings with previous seminal technostress research (Ragu-Nathan et al., 2008). Jena (2015) examined the relationship between techno-overload (5 items; $\alpha = 0.83$) and job satisfaction. The hypothesis test between techno-overload and job satisfaction indicated a negatively significant ($\beta = -0.16$, $t = -2.34$, $p < 0.01$) result. The result showed that techno-overload was a technostress creator that significantly and negatively affected job satisfaction among ICT users. The result implied an increase in techno-overload

decreased employee job satisfaction in ICT employees. Ragu-Nathan et al. (2008)

examined the relationship between techno-overload (5 items; α = 082) and job

satisfaction. The studies included the technostress creators' scale to measure techno-

overload and the JSS scale to measure employee job satisfaction (Spector, 1985b). The

study revealed consistent findings with previous seminal technostress research (Ragu-

Nathan et al., 2008). All results implied an increase in techno-overload decreased

employee job satisfaction in ICT employees.

Techno-Invasion Dimension and Job Satisfaction

The relationship between the techno-invasion dimension and job satisfaction

showed significantly negative relationships consistently. Al-Ansari and Alshare (2019)

investigated the relationship between techno-invasion (4 items; α = 0.80) and job

satisfaction. Al-Ansari and Alshare (2019) showed that techno-invasion negatively

predicted job satisfaction. Ragu-Nathan et al. (2008) examined the relationship between

techno-overload (5 items; α = 082) and job satisfaction. The studies included the

technostress creators' scale to measure techno-overload and the JSS scale to measure

employee job satisfaction (Spector, 1985b). The study revealed consistent findings with

previous seminal technostress research (Ragu-Nathan et al., 2008). Jena (2015) examined

the relationship between techno-invasion (4 items; α = 0.87) and job satisfaction. The

hypothesis test between techno-invasion and job satisfaction indicated a negatively

significant ($\beta = -0.18$, $t = -1.23$, $p < 0.01$) result. The result showed that techno-invasion

was a technostress creator that significantly and negatively affected job satisfaction

among ICT users. The study revealed consistent findings with previous seminal

technostress research (Ragu-Nathan et al., 2008). Ragu-Nathan et al. (2008) examined the relationship between techno-invasion ($\alpha = 0.80$) and job satisfaction. The studies included the technostress creators' scale to measure techno-invasion and the JSS scale to measure job satisfaction (Spector, 1985b). All results implied an increase in techno-invasion decreased employee job satisfaction in ICT employees.

Techno-Complexity Dimension and Job Satisfaction

The relationship between the techno-complexity dimension and job satisfaction showed significantly negative relationships consistently. Al-Ansari and Alshare (2019) investigated the relationship between techno-complexity (5 items; $\alpha = 0.77$) and job satisfaction ($\alpha = 0.74$). Al-Ansari and Alshare (2019) showed that techno-complexity was negatively significant in predicting job satisfaction. Jena (2015) examined the relationship between techno-complexity (4 items; $\alpha = 0.82$) and job satisfaction ($\alpha = 0.74$). The hypothesis test between techno-complexity and job satisfaction indicated a negatively significant ($\beta = -0.21$, $t = -2.14$, $p < 0.01$) result. The result showed that techno-complexity was a technostress creator that significantly and negatively affected job satisfaction among ICT users. The result implied that increased techno-complexity decreased job satisfaction among ICT employees. Ragu-Nathan et al. (2008) examined the relationship between techno-complexity (5 items; $\alpha = 0.77$) and job satisfaction ($\alpha = 0.74$). The studies included the technostress creators' scale to measure techno-complexity and the JSS scale to measure job satisfaction (Spector, 1985b). All results implied an increase in techno-complexity decreased employee job satisfaction in ICT employees.

Techno-Insecurity Dimension and Job Satisfaction

The relationship between the techno-insecurity dimension and job satisfaction showed significantly negative relationships consistently. Al-Ansari and Alshare (2019) investigated the relationship between techno-insecurity (5 items; α = 0.78) and job satisfaction (α = 0.74). Al-Ansari and Alshare (2019) showed that techno-insecurity was negatively significant in predicting job satisfaction. Jena (2015) examined the relationship between techno-insecurity (4 items; α = 0.78) and job satisfaction. The hypothesis test between techno-insecurity and job satisfaction indicated a negatively significant (β = -0.21, t = -1.89, p < 0.01) result (Jena, 2015). The result showed that techno-insecurity was a technostress creator that significantly and negatively affected job satisfaction among ICT users. The result implied an increase in techno-insecurity decreased employee job satisfaction in ICT employees. Ragu-Nathan et al. (2008) examined the relationship between techno-insecurity (5 items; α = 0.78) and job satisfaction. The studies included the technostress creators' scale to measure techno-insecurity (4 items; α = 0.78) and the JSS scale to measure the job satisfaction (Spector, 1985b). All results implied an increase in techno-insecurity decreased employee job satisfaction in ICT employees.

Techno-Uncertainty Dimension and Job Satisfaction

The relationship between the techno-uncertainty dimension and job satisfaction showed significantly negative relationships consistently. Al-Ansari and Alshare (2019) investigated the relationship between techno-uncertainty (4 items; α = 0.83) and job satisfaction (α = 0.74). Al-Ansari and Alshare (2019) showed that techno-uncertainty was

negatively significant in predicting job satisfaction. Jena (2015) examined the relationship between techno-uncertainty (4 items; α = 0.83) and job satisfaction. The hypothesis test between techno-uncertainty and job satisfaction indicated a negatively significant result (β = -0.19, t = -2.12, p < 0.01). The result showed that techno-uncertainty was a technostress creator that significantly and negatively affected job satisfaction among ICT users. The result implied an increase in techno-uncertainty and decreased employee job satisfaction in ICT employees. Ragu-Nathan et al. (2008) examined the relationship between techno-uncertainty (4 items; α = 0.83) and job satisfaction. The studies included the technostress creators' scale to measure techno-uncertainty and the JSS scale to measure job satisfaction (Spector, 1985b). All results implied an increase in techno-uncertainty and decreased employee job satisfaction in ICT employees.

Technostress and FRLT Styles

One researcher studied the interaction between technostress and leadership styles. Boyer-Davis (2018) examined a specific research problem where previous researchers should have considered the relationship between technostress and FRLT. The research aimed to examine the influence of FRLT styles on technostress in IT managers (Boyer-Davis, 2018). Boyer-Davis (2018) asked what effect transformational, transactional, and passive-avoidant leadership styles have on the technostress of information technology (IT) managers in the U.S. while controlling age, gender, education, and industry experience.

The research from Boyer-Davis included strengths and weaknesses. One strength of Boyer-Davis's research was the positive and significant association between Bass and Avolio's FRLT model (i.e., transactional and laissez-faire leadership), excluding transformational leadership and all five dimensions of Tarafdar's technostress creators' model (i.e., techno-overload, techno-invasion, techno-complexity, techno-insecurity, techno-uncertainty). The study included three weaknesses. The first weakness was the lack of generalizability of the results in other populations. For instance, the results only pertained to information technology managers. The second weakness was that the study only discussed technostress from a managerial perspective. The third weakness of the study was not stating the hypotheses in the research design section but stating the results of the hypotheses in the results section. The unit of analysis in this study was the information technology (IT) managers rather than IT employees.

Technostress and Transformational Leadership Style

Technostress and transformational leadership had limited research regarding their association. Boyer-Davis (2018) examined the influence of FRLT styles on technostress. Boyer-Davis (2018) found that transformational leadership did not significantly correlate with technostress in information system (IS) managers. The research implied that transformational leadership did not significantly predict technostress within information system (IS) managers. Boyer-Davis's research did not reveal additional studies that portray the relationship between technostress and transformational leadership style from the FRLT model.

Technostress and Transactional Leadership Style

Like transformational leadership, technostress and transactional leadership had limited research on their association. Boyer-Davis (2018) found that transactional leadership significantly predicted technostress among information system (IS) managers in the U.S. It is important to note that the study did not include surveys from IT employees based on the study's research questions and research design. This research implied that transactional leadership increased the prevalence of technostress in ICT workers. The literature did not reveal additional research studies that portray the relationship between technostress and transactional leadership style from the FRLT model.

Technostress and Laissez-Faire Leadership Style

Technostress and laissez-faire leadership had limited research on their association. Boyer-Davis (2018) found that laissez-faire leadership had a significant and positive correlation with technostress among information system (IS) managers in the U.S. This research implied that laissez-faire leadership increased the prevalence of technostress in ICT workers. The literature did not reveal additional research studies that portray the relationship between technostress and passive-avoidant leadership style from the FRLT model.

Job Satisfaction

Job satisfaction is an essential outcome of this study. Valldeneu et al. (2021) indicated that job satisfaction is an essential outcome because it is a critical factor affecting an organization's success. Mufti et al. (2020) indicated that job satisfaction is an

essential outcome for organizations because employees are nontangible assets, and their job dissatisfaction affects their employee efficiency and, ultimately, the organization's overall success. Worthy et al. (2020) indicated that high levels of job satisfaction lead to more productive employees who execute pertinent organizational objectives. Puni et al. (2018) indicated that organizations could not succeed by ignoring the attitudes of their employees.

The research indicated varying definitions of job satisfaction. Evelyn and Ling (2021) supported that job satisfaction had ambiguous definitions within the research literature. For example, Mufti et al. (2020) indicated that job satisfaction referred to positive feelings toward a position, while job dissatisfaction was negative. This observation provided distinct definitions for job satisfaction and job dissatisfaction. La Torre (2019) indicated that job satisfaction was a positive emotional state based on an individual's job appraisal. Khan et al. (2013) indicated that job satisfaction was an employee's emotion about a job.

Transformational Leadership Style

The three leadership styles in the FRLT are the moderating variables in this study. The FRLT model has nine factors encompassing transformational, transactional, and laissez-faire (i.e., passive avoidant) leadership styles (Bass & Avolio, 2004). Transformational leadership is the first leadership within the FRLT model. Transformational leadership has five factors: idealized attributes and behaviors, individualized consideration, intellectual stimulation, and inspirational motivation (Bass & Avolio, 2004; Valldeneu et al., 2021). Burns (1978) invented the term transformational

leadership based on political leaders aspiring from transactional and progressing to transformational leadership styles. Bass and Avoilio (2004) extended research from Burns's (1978) concept of transformational leadership into the FRLT model. The literature indicated that transformational leadership is the most successful form of leadership, as stated in Bass and Avolio's (2004) FRLT model. The literature revealed that transformational leadership involves leaders having an interactive and less transactional relationship with an employee. Valldeneu et al. (2021) supported this claim by insisting that the transformational leadership style is the most active and effective leadership style of the FRLT model. Mufti et al. (2020) extended the literature by indicating that transformational leadership focused is a people-oriented style based on team interaction and participation. Visvanathan et al. (2018) supported this argument by implying that transformational leadership motivates and challenges employees to achieve a mission or goal for an organization.

However, the literature needed consistency in whether the transformational leadership style included four or five dimensions. Itzkovich et al. (2020) showed that transformational leadership had four dimensions: (a) idealized influence, (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration in alignment with Itzkovich et al. (2020), Visvanathan et al. (2018) indicated that transformational leadership included four dimensions: (a) idealized influence, (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration. On the contrary, the literature showed other researchers that the transformational leadership style included five dimensions. Barnett's (2018) assessment of the five dimensions of transformational

leadership supported Bass and Avolio's (2004) FRLT model. The literature showed the intent behind leaders progressing from a transactional leadership style to transformational leadership. Passakonjaras and Hartijasti (2019) supported this claim regarding transitioning from a transactional to a transformational leader. Although the literature indicated transformational leadership as the pinnacle of the FRLT model, the literature also revealed that transformational leaders need transactional leadership styles.

Idealized Influence (II) - Attributes (IIA) Dimension

The idealized influence–attributes dimension provided a consistent consensus regarding the idealized attributes of a transformational leader. Visvanathan et al. (2018) align with Valldeneu et al. (2021) based on how the idealized attributes dimension describes how employees trust their leader as a role model. While the other researchers discussed how subordinates view the leaders as role models, Barrett (2019) aligned with Torlak and Kuzey (2019) by espousing that the idealized attributes dimension describes how well the employee identifies the leader's influence in terms of charisma. Based on the literature, transformational leaders require ongoing cognizance of their cultural habits within a workplace setting. The literature suggested that an idealized attribute signified a specific attribute that a subordinate should follow within a group or organization. The previous researchers agree with Bass and Avolio (2004) regarding the idealized attributes dimension of the transformational leadership style. Transformational leadership's idealized influence attribute dimension addressed how followers view specific leadership attributes based on the followers' appraisal of the leader's charisma. The researchers

provided how employees seek to attain specific attributes of a leader that would benefit their current work or future career.

However, the literature revealed a discrepancy regarding the number of dimensions within the idealized influence dimension of transformational leadership. The research showed that Bass and Avolio (2004) broke out the idealized influence dimension to reflect the idealized influence of attributes and behavior of leaders as distinct dimensions. This subtlety in the research indicated a change from four to five dimensions in the FRLT model; however, not all researchers acknowledge this. For example, Visvanathan et al. only mentioned four dimensions of transformational leadership rather than five. Visvanathan et al. (2018) indicated four dimensions within transformational leadership: (a) idealized influence, (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration. The literature showed that the researcher only included idealized influence as one dimension rather than the idealized influence of attributes and idealized influence of behavior. Like Visvanathan et al. (2018), other researchers acknowledged four rather than five dimensions regarding the idealized influence attribute (Baptiste, 2019; Escortell et al., 2020; Li et al., 2018; Puni et al., 2018; Worthy et al., 2020). On the contrary, Valldeneu et al. (2021) indicated five dimensions within transformational leadership: (a) idealized attributes, (b) idealized behaviors, (c) inspirational motivation, (d) intellectual stimulation, and (e) individualized consideration. Like Valldeneu et al. (2021), other researchers included all five dimensions of transformational leadership as depicted in Bass and Avolio's (2004) FRLT model (Alamir et al., 2019; Barnett, 2018, 2019; Torlak & Kuzey, 2019). The subtlety in

the research is important because the literature should have consistency among dimensions as researchers measure a leader's idealized influence attributes and behavior.

Idealized Influence - Behavior (IIB) Dimension

The individualized influence-behavior dimension had a consistent consensus about the idealized behavior of a transformational leader. Valldeneu et al. (2021) indicated that the idealized behavior dimension describes how employees appraise their leader's behavior. Likewise, Barrett (2019) extended the literature by explaining that the idealized behavior dimension describes how employees perceive their leadership's ethical and moral behavior. Torlak and Kuzey (2019) suggested that the idealized behavior dimension depicts how followers perceive their leader's behavior. The literature suggested that idealized behavior signified a specific behavior that a subordinate should follow within a group or organization. The previous researchers agreed with Bass and Avolio (2004) regarding the idealized behavior dimension of the transformational leadership style. Transformational leadership's idealized behavior dimension addressed the basis for followers to appraise leadership style based on the transformational leader's behavior. The research showed how employees seek to appraise the influence of their leader based on the leader's behavior.

Inspirational Motivation (I.M.) Dimension

There is consistent agreement about the inspirational motivation dimension of a transformational leader. Bass and Avolio (2004) offered that the inspirational motivation dimension describes a leader communicating shared goals and identifying the top priorities for followers simply. Visvanathan et al. (2018) agreed with the previous

research of Bass and Avolio (2004) by describing inspirational motivation as motivating employees to inspire teamwork and commitment through motivational actions. The researchers showed that transformational leaders could inspire and communicate effectively for subordinates to follow. Barrett (2019) indicated that the inspirational motivation dimension describes when a leader can communicate high-level expectations and inspire enthusiasm and motivation in subordinates. Valldeneu et al. (2021) indicated that the inspirational motivation dimension describes when leaders can communicate meaningful purposes to employees to arouse optimism and enthusiasm. The literature showed that all authors agreed regarding describing the inspirational motivation dimension of a transformational leader.

Intellectual Stimulation (I.S.) Dimension

There was a consistent agreement about the intellectual stimulation dimension of a transformational leader. Bass and Avolio (2004) explained that the intellectual stimulation dimension describes a leader who promotes employees to utilize reasoning and innovation for problem-solving. Visvanathan et al. (2018) stated that intellectual stimulation is when leaders allow employees to be innovative and apply critical reasoning. Barrett (2019) stated that the intellectual stimulation dimension of transformational leadership describes when a leader encourages a subordinate to be innovative and create to solve organizational problems. Valldeneu et al. (2021) indicated that the intellectual stimulation dimension describes leaders promoting employees' reasoning, stimulation, and problem-solving. The researchers showed that the intellectual stimulation dimension implies a transformational leader trusts followers to think through

problems and find solutions. The research on the intellectual stimulation dimension showed that all authors agreed regarding the description of the intellectual stimulation dimension of a transformational leader.

Individualized Consideration (I.C.) Dimension

The individualized consideration dimension had a consistent consensus about the individualized consideration of a transformational leader. Bass and Avolio (2004) offered that the individualized consideration dimension describes leaders who understand their subordinates' concerns and interact one-on-one to promote their career growth. Visvanathan et al. (2018) stated that individualized consideration is when leaders consider their employees' needs. Barrett (2019) stated that the individualized consideration factor of transformational leadership describes when a leader helps develop a subordinate's highest ability through coaching and mentorship. Valldeneu et al. (2021) indicated that the individualized consideration dimension describes leaders promoting individuality among employees. The literature showed that all authors agreed regarding describing the individualized consideration dimension of a transformational leader.

Consequences of Transformational Leadership

Transformational Leadership Style and Job Satisfaction

Transformational leadership had a significantly positive relationship with job satisfaction. Valldeneu et al. (2021) examined the relationship between leadership styles and organizational outcomes (i.e., effectiveness, job satisfaction, and extra effort). Valldeneu et al. (2021) reported that transformational leadership had a significantly positive relationship ($\beta = 0.812$, $t = 16.869$, $p < 0.001$; $r = 0.885$, $p < 0.01$) with

organizational outcomes. This research article was essential to this study because it

helped explain how the three dimensions of the FRLT affect employee job satisfaction.

DeLay and Clark (2020) investigated the relationship between managers' perceived

transformational leadership style ($r = 0.78$, $p < 0.001$) on employee job satisfaction. They

found that transformational leadership positively and significantly influenced employee

job satisfaction. The sample selection of the ICT population included a random sample of

855 magnetic resonance (MR) technologists within the American Society of Radiologic

Technologists (DeLay & Clark, 2020). DeLay and Clark (2020) used the Vannsimpco

Leadership Survey and the Job Satisfaction Survey (JSS). The researchers did not utilize

the MLQ Form-5X instrument for transformational, transactional, and passive-avoidance

leadership styles; however, the Vannsimpco Leadership Survey assessed these styles.

Mufti et al. (2020) examined the relationship between transformational leadership and

employee job satisfaction, and the researchers found that transformational leadership had

a significantly positive relationship ($\beta = 0.18$, $t = 3.12$, $p < 0.01$). The study included 189

participants from private educational institutions in Pakistan. Torlak and Kuzey (2019)

indicated that all the transformational leadership dimensions were statistically significant:

idealized influence dimension (II) ($\beta = 0.45$, $t = 7.68$, $p < 0.001$), inspirational motivation

(IM) dimension ($\beta = 0.18$, $t = 2.92$, $p < 0.001$), individual consideration (IC) dimension

($\beta = 0.27$, $t = 3.80$, $p < 0.001$), and intellectual stimulation (IS) dimension ($\beta = 0.48$, $t =$

6.44, $p < 0.001$). One strength of the research article was the inclusion of the individual

dimensions of transformational leadership. Barnett (2018) examined the relationship

between transformational leadership and job satisfaction, and the researcher found that

transformational leadership had a significantly positive relationship with job satisfaction

(β = .638, p < 0.0005, t = 4.858). Barnett (2018) showed that transformational leadership

predicted employee job satisfaction. The researcher used MLQ Form 5X and JSS

instruments (Bass & Avolio, 2004; Spector, 1985b). The sample population included 800

faculty members (i.e., online-based adjunct educators) who utilized ICT at a for-profit

university in the United States. The results showed that using transformational leadership

increased the employee job satisfaction of online-based adjunct educators. Visvanathan et

al. (2018) examined the impact of transformational leadership on job satisfaction and

found that transformational leadership had a significantly positive impact (β= 0.332, t =

3.187, p = 0.002) on employee job satisfaction. The researchers used the MLQ Form-5X

and the Minnesota Satisfaction Questionnaire (MSQ). Visvanathan et al. (2018) included

a sample size of 127 participants from the Malaysian manufacturing industry. One

weakness of the study was the lack of explanation regarding how the individual factors of

transformational leadership influence job satisfaction.

Although the literature indicated research that showed transformational leadership

had a significant and positive relationship with employee job satisfaction in most cases,

the literature also indicated that transformational leadership did not have a significant and

positive relationship with employee job satisfaction. Puni et al. (2018) acknowledged

research from Thamrin (2012) that showed transformational leadership had no significant

impact on job satisfaction. Thus, the research showed that transformational leadership

does not positively and significantly impact job satisfaction. Mathieu and Babiak (2015)

provided a study in which transformational leadership did not yield a significantly

positive relationship with job satisfaction. Mathieu and Babiak (2015) examined the

impact of corporate psychopathy on leaders and employee attitudes based on 423 survey

participants. One area for improvement of the research article was the need for more

information regarding the sample population. The type of employment for the sample

population needs to be clarified.

Transformational Leadership Style, Job Satisfaction, and ICT

The literature needed more research integrating transformational leadership style,

job satisfaction, and ICT. Barnett (2018) addressed the relationship between the

dimensions of FRLT and employee job satisfaction of online adjunct faculty in the

United States. Also, Barnett (2018) found that transformational leadership style had a

positive and significant predictor of job satisfaction, transactional was a negative and

significant predictor of job satisfaction, and laissez-faire was not significant.

Transactional Leadership Style

Transformational leadership has a consistent definition of transactional

leadership. Transactional leadership has two dimensions: (a) contingent regards and (b)

active management-by-exception (Bass & Avolio, 2004; Valldeneu et al., 2021).

Likewise, Visvanathan et al. (2018) agreed that transformational leadership includes two

dimensions known as (a) contingent rewards and (b) active and passive management by

exception. According to Barnet (2018), Burns (1978) proposed the transactional

leadership theory counterpart to transformational leadership theory. DeLay and Clark

(2020) showed that transactional leaders create an exchange process with followers based

on extrinsic motivational factors. The extrinsic motivational factors include rewards

when followers maintain the status quo. Mufti et al. (2020) agreed with DeLay and Clark (2020) that transactional leadership was a task-oriented style that negated team interaction and participation. Barrett (2019) also agreed with researchers by stating that the transactional leadership theory originated from Burns (1978), in which a leader uses extrinsic motivational factors (e.g., praises, rewards, and promises) to promote self-interest to accomplish organizational milestones. The research indicated that transactional leaders showed a self-serving form of leadership that only allows followers to reach their highest potential. Based on the literature, transactional leaders provided a basis for transactional leaders to aim for transformational leaders.

Contingent Rewards Dimension

The literature revealed a consistent agreement about the contingent rewards dimension of a transactional leader. Valldeneu et al. (2021) indicated that the dimension of contingent reward describes leaders using rewards, promises, and praise to motivate followers toward a desired performance level or achievement. Likewise, Visvanathan et al. (2018) stated that the contingent rewards of transformational leadership imply when leaders appraise employees' results based on established standards. The literature showed a consistent agreement about the contingent rewards dimension of a transactional leader.

Active Management-by Exception Dimension

The literature revealed a consistent agreement about the contingent rewards dimension of a transactional leader. Valldeneu et al. (2021) indicated that the dimension of active management by exception describes leaders who monitor employee performance and correct any deviation from an associated standard. Barrett (2019)

indicated that the active management-by-exception dimension describes leaders who

communicate standards and policies to their subordinates and intervene before employees

violate organizational standards. Visvanathan et al. (2018) stated that active management-

by-exception occurs when leaders focus on employees' compliance to achieve a result.

Kouali (2017) indicated that active management-by-exception occurs when leaders

expect employees to utilize noninnovative ways to complete current tasks.

The literature consistently agreed about a transactional leader's active management-by-

exception dimension.

Consequences of Transactional Leadership Style

Transactional Leadership Style and Job Satisfaction

Transactional leadership had mixed results regarding the relationship with job

satisfaction. Torlak and Kuzey's (2019) research indicated no significant effect (β=

0.00077, t = 0.02, p < 0.01) on the dimension of the contingent reward. Still, the results

indicated a significantly positive influence (β= 0.023, t = 4.50, p < 0.01) on the active

management-by-exception dimension. DeLay and Clark (2020) examined the relationship

between managers' perceived transactional leadership style and employee job satisfaction.

DeLay and Clark (2020) found that transactional leadership had a significantly positive

correlation (r = 0.81, p < 0.001) with employee job satisfaction. DeLay and Clark (2020)

used the Vannsimpco Leadership Survey and the Job Satisfaction Survey (JSS). Mufti

(2020) scrutinized the impact of leadership style (i.e., transformational and transactional

leadership) on job satisfaction with an intervening variable, and the research resulted

from a significantly positive association (β = 0.13, t = 2.27, p < 0.01) between leadership

style and job satisfaction. Torlak and Kuzey (2019) examined the impact of transactional leadership on job satisfaction. Transactional leadership's contingent reward (CR) dimension was not statistically significant ($\beta = 0.00077$, $t = 0.02$). The management-by-exception dimension of transformational leadership was not statistically significant ($\beta = 0.23$, $t = 4.50$).

However, the research showed that transactional leadership only sometimes positively impacts employee job satisfaction. Valldeneu et al. (2021) examined the relationship between leadership styles and organizational outcomes (i.e., effectiveness, job satisfaction, and extra effort). Valldeneu et al. (2021) reported that transactional leadership had no statistically significant impact ($\beta = -0.014$, $t = -0.339$, $p = 0.735$; $r = 0.570$, $p < 0.01$) on organizational outcomes. Barnett (2018) examined the relationship between transactional leadership and job satisfaction, and the researcher found that transactional leadership had a significantly negative relationship with job satisfaction ($\beta = -.289$, $p < 0.006$, $t = -2.81$). The results showed that transactional leadership decreased employee job satisfaction among online-based adjunct educators.

Visvanathan et al. (2018) examined the impact of transactional leadership on job satisfaction and found that transactional leadership had a significantly positive impact ($\beta = 0.297$, $t = 2.854$, $p = 0.005$) on employee job satisfaction. The researchers used the MLQ Form-5X and the Minnesota Satisfaction Questionnaire (MSQ). Visvanathan et al. (2018) included a sample size of 127 participants from the Malaysian manufacturing industry. One weakness of the study was the lack of explanation regarding how the individual factors of transactional leadership influence job satisfaction.

Mathieu and Babiak (2015) provided a study in which transactional leadership did not yield a significantly positive relationship with job satisfaction. Mathieu and Babiak (2015) examined the impact of corporate psychopathy on leaders and employee attitudes based on a survey of 423 survey employees and 72 supervisors. In this study, the supervisors and employees are from the same organization. The researcher used the FRLT model to elicit transactional leadership. One area for improvement of the research article was the need for more information regarding the sample population. The type of employment for the sample population needs to be clarified.

Transactional Leadership Style, Job Satisfaction, and ICT

However, it is essential to note that some studies with relationships between transactional leadership style and employee job satisfaction do not necessarily indicate a positive and significant relationship. For example, Barnett (2018) addressed the relationship between the dimensions of FRLT and employee job satisfaction of online adjunct faculty in the United States. Barnett (2018) found that transformational leadership style had a positive and significant predictor of job satisfaction, transactional was a negative and significant predictor of job satisfaction, and laissez-faire was not significant. Another significant factor in this study is ICT to complete their duties as online adjunct faculty.

Passive-Avoidant Leadership Style

The passive-avoidant leadership style is the third dimension of Bass and Avolio's (2004) FRLT model. Bass and Avolio (2004) espoused that passive-avoidant leadership has two factors: passive management-by-exception and laissez-faire. The passive-

avoidant leadership style included the passive management-by-exception and laissez-faire dimensions.

Passive Management-by-Exception Dimension

The literature provided a stable meaning of the laissez-faire dimension of the passive-avoidant leadership style. Valldeneu et al. (2021) indicated that the passive management-by-exception dimension of the passive-avoidance leadership style showed leaders who only decided to intervene after the employee failed to meet a prescribed standard. Barrett (2019) indicated that the passive management-by-exception dimension describes a leader who only intervenes in employees' affairs after a problem manifests. Visvanathan et al. (2018) included transformational and transactional leadership theories. The researchers did not include the passive avoidant leadership style in their study. The researcher considered passive management by exception as a dimension within transactional leadership. Evelyn and Ling (2021) stated that job satisfaction had ambiguous definitions within the research literature. Barrett (2019) elaborated that Bass and Avolio (2004) moved the passive management-by-exception dimension from transactional leadership to the passive-avoidant leadership style. The literature consistently described the passive management-by-exception dimension of the passive-avoidant leadership style.

Laissez-Faire Dimension

The literature showed a distinct consensus on the laissez-faire factor of the passive-avoidant leadership style. Itzkovich et al. (2020) supported previous research (Bass & Avolio, 2004) that laissez-faire leadership is the least effective because the style

represents an absence or avoidance of leadership. Guevara et al. (2019) stated that the laissez-faire leadership style in the FRLT represented the least-desired form of leadership in the FRLT model. The literature showed that the laissez-faire leadership factor in the passive avoidant leadership styles describes an absence of leadership in the FRLT model. Valldeneu et al. (2021) indicated that the laissez-faire dimension describes leaders who avoid leadership or involvement with the employee. The literature revealed that passive/avoidant leadership and laissez-faire leadership are interchangeable. Barnett (2018) agreed with the argument that researchers use passive/avoidant and laissez-faire as interchangeable terms in the literature. The literature consistently defined the laissez-faire factor of the passive-avoidant leadership style based on recent research. However, the literature revealed discrepancies regarding the feasibility of laissez-faire. Véronique et al. (2021) critiqued previous research about laissez-faire leadership, focusing on the direct effects of laissez-faire rather than the indirect effects. Also, Véronique et al. (2021) indicated that an employee's disposition could affect their perspective on laissez-faire leadership. Previous research from Yang (2015) and Jelaca et al. (2020) aligns with the study from Veronique et al. (2021) in that some employees perceive laissez-faire leadership as a sense of autonomy and independence.

Consequences of Passive-Avoidant Leadership Style

Passive Avoidant Leadership Style and Job Satisfaction

Passive-avoidant leadership had a significantly negative relationship with job satisfaction. Valldeneu et al. (2021) examined the relationship between leadership styles and organizational outcomes based on responses from 167 participants from Spain.

Valldeneu et al. (2021) reported that passive-avoidant leadership had a significantly negative correlation (β= -0.167, t = -4.168, p < 0.001; r = -0.484, p < 0.01) with job satisfaction. One weakness of the research was the lack of information regarding the participants' occupations. The information would aid in understanding the generalizability of the results to other populations.

DeLay and Clark (2020) investigated the relationship between managers' perceived passive avoidant leadership styles and employee job satisfaction. DeLay and Clark (2020) found that this leadership style correlated significantly negatively (r = -0.14, p = 0.002) with employee job satisfaction. La Torre (2019) indicated that job satisfaction was a positive emotional state based on an individual's job appraisal.

However, passive-avoidant leadership only sometimes yields a significantly negative relationship. For example, Barnett (2018) examined the relationship between laissez-faire leadership and job satisfaction. Barnett (2018) found that laissez-faire leadership was not statistically significant among online adjunct educators at a for-profit university in the United States. The researcher used the MLQ-5X instrument to examine transformational, transactional, and passive-avoidant leadership styles and the JSS instrument to examine employee job satisfaction (Bass & Avolio, 2004; Spector, 1985b).

Summary and Conclusions

The study included the examination of the relationship between technostress and job satisfaction. The major themes in the literature assess the relationship between technostress and job satisfaction and technostress and leadership styles. Other themes included the relationship between FRLT and job satisfaction. Previous research showed

evidence that FRLT had a relationship with technostress. Also, previous research

indicated that technostress had a relationship with job satisfaction. These aspects cover

what researchers know in the disciplines related to the topic of the study. The research

showed evidence that the transformational leadership style was the most effective in the

FRLT theory, while passive-avoidant leadership is the least effective in the FRLT theory.

This finding was necessary for the proposed study because leadership style was the

moderating variable of this study. The research substantiated that FRLT theory is

consistent with past literature. This study extended Boyer-Davis's (2018) theoretical

framework of technostress and FRLT styles and Al-Ansari and Alshare's (2019)

technostress and job satisfaction framework. Examining the moderating role of FRLT

between technostress and job satisfaction addressed the literature gap in Chapter 3.

Chapter 3: Research Method

I examined if technostress determines employee job satisfaction based on the moderating role of FRLT. Chapter 3 described the research design, rationale, and methodology. The methodology included the population, sampling, recruitment, participation, data collection, instrumentation and operationalization of constructs, data analysis plan, threats to validity, ethical procedures, and a summary.

Research Design and Rationale

The philosophical assumptions for this study included a postpositivist paradigm. Creswell and Creswell (2018) indicated that a postpositivist perspective (i.e., determinism) describes causes that determine outcomes. The postpositivist paradigm is appropriate because the study's paradigm included measuring factors within the constructs of technostress, leadership styles, and job satisfaction. Based on this paradigm, the postpositivist approach is appropriate for this study.

Research Methodology

The postpositivist paradigm of the study led to the decision to use a quantitative methodology research approach. The predictor variable is technostress, measured by the technostress creators' instrument (Tarafdar et al., 2007). The moderating variables are transformational, transactional, and laissez-faire leadership styles within the FRLT model as measured by the MLQ-5x Short Rater Form (Bass & Avolio, 2004). The outcome variable is the job satisfaction (Spector, 1985a). I aimed to examine if the technostress of ICT employees determines job satisfaction based on the moderating impact of leadership styles within FRLT. The study included three research questions.

RQ1. To what extent does technostress determine employee job satisfaction among ICT employees?

RQ2. To what extent do leadership styles determine employee job satisfaction among ICT employees?

RQ3. As the correlation of leadership style increases, how does the relationship between technostress and ICT employee job satisfaction increase or decrease?

The purpose and the research questions indicate the measurement of variables from a deductive perspective. A quantitative research approach is appropriate for testing theories by assessing the relationship between variables (Creswell & Creswell, 2018). Burkholder et al. (2016) indicated that the quantitative design included a deductive approach where researchers generate hypotheses and collect data to support a theory.

The qualitative research methodology was inappropriate because the research questions were not inductive. Creswell and Creswell (2018) indicated that qualitative research methodology is inductive and explores a phenomenon. Since the research questions do not have these characteristics, a qualitative approach would not be an appropriate research methodology.

Research Design

The study's research design included a nonexperimental and correlational approach with the moderating role of FRLT ratings between technostress and employee job satisfaction. The quantitative analysis examined relationships between leadership styles, technostress, and job satisfaction without manipulation (Burkholder et al., 2016).

The nonexperimental quantitative research approach was appropriate based on several points. Nonexperimental research does not include variable manipulation or random assignment to groups within a study (Creswell & Creswell, 2018). Creswell and Creswell (2018) indicated that survey design helps researchers answer relationships between variables. The purpose, research questions, and hypotheses suggest that a relationship exists between technostress, leadership styles (i.e., moderating variables), and *job satisfaction* (i.e., dependent variable). The study data came from a survey including participants' Likert-type responses.

I used a correlational research design to assess levels of association between variables. Creswell and Creswell (2018) indicated that nonexperimental quantitative research designs could include descriptive, causal-comparative, or correlational designs. The purpose and the research questions determined the type of research design. The research questions were not descriptive because the study aimed to examine the relationship between an independent and dependent variable rather than describe the characteristics of a sample population. The correlational research design was appropriate based on this circumstance.

Methodology

Population

The study's target population was employees that use ICT in the U.S. The target population size for ICT employees in the U.S. is unknown.

Sampling and Sampling Procedures

This study included a purposive sampling strategy. Nonprobability sampling does not include a random selection of research participants, and not all members of an associated population will have an equal chance of participation (Puni et al., 2018). Purposive sampling is a nonprobability sampling that includes selecting characteristics of an associated population (Puni et al., 2018). The purposive sampling strategy included acquiring data from prospective participants that satisfied the study's inclusion criteria.

The target sample included information technology (IT) nonmanagement employees who utilize ICT and identify as subordinates in six states in the Southeastern United States (e.g., Mississippi, Louisiana, Arkansas, Alabama, Georgia, and Tennessee). The study included data from Qualtrics to offer a prospective sample. Qualtrics randomly selected participants based on inclusion and exclusion criteria. Inclusion criteria included (a) part-time or full-time employment status, (b) 3 years or more of being employed, and (c) identifying as a non-management employee who utilized ICT. The survey collected demographic data such as age, gender, ethnicity, annual income, and occupation.

Power Analysis

I used G*Power software to ascertain the sample size for the quantitative research study. The apriori power analysis parameters in the F family of tests for multiple linear regression included a medium effect size (i.e., $f^2 = 0.15$), alpha (α) of 0.15, and power (1-β) of 0.95 for two predictor variables (Faul et al., 2009). Based on G*Power software (version 3.1.9.4), the minimum sample size for two predictor variables (i.e., technostress and leadership style) was 107 participants (Faul et al., 2009).

Figure 1

MLR for F tests in G*Power Software
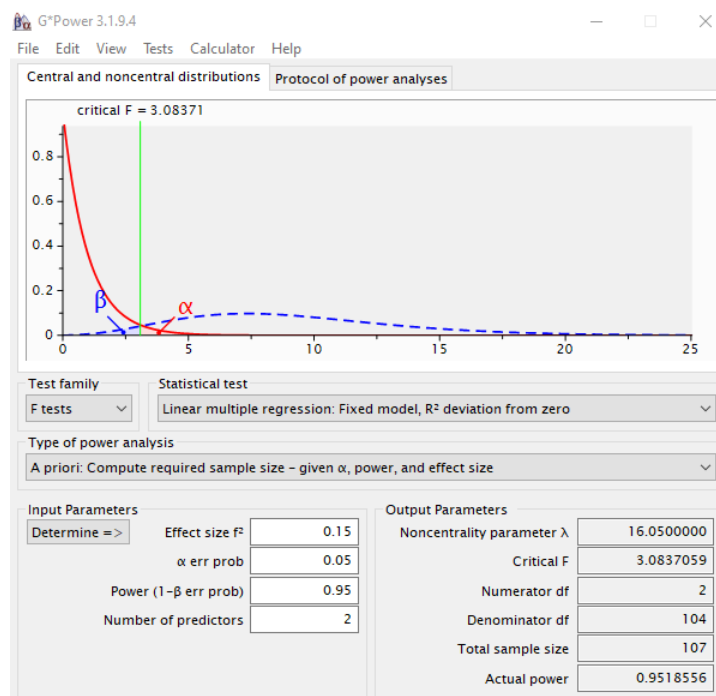
Note. G*Power 3.1.9.4 software was used to perform an a priori power analysis to calculate the required sample size – given α, power, and effect size for MLR (i.e., fixed model, R2 deviation from zero).

Procedures for Recruitment, Participation, and Data Collection

Procedures for Recruitment

The survey administrator, Qualtrics, provided participant recruitment and hosted this study's survey instruments through their online platform. Qualtrics is a third-party service that administers online surveys based on its participant pool. Qualtrics recruited a pool of participants based on the inclusion and exclusion criteria. Qualtrics only emailed invitations to participants who met the inclusion criteria. The inclusion, exclusion criteria,

and demographic questions for target sample participants included (a) part-time or full-time employment status, (b) at least 3 years of employment, and (c) identification as a non-management employee who utilizes ICT. The demographic questions acquired gender, age, ethnicity, annual income, and occupation with an organization based in the US. Qualtrics acquired personal information such as participants' names, email addresses, physical addresses, and phone numbers. In addition, the third-party service provider did not provide any personal information to the researcher.

Informed Consent

The survey included eligibility and informed consent sections that screened out unqualified or participants unwilling to complete the survey. Potential participants completed an online consent form that describes the study. The online consent form briefly described the study and assured participants of their responses' anonymity. Prospective participants who met the inclusion criteria and provided informed consent continued the survey. Prospective participants that did not meet the inclusion criteria within the eligibility section of the survey exited the study.

Data Collection Via Online Survey

Qualtrics secured and protected the data from each participant. In addition, Qualtrics sent the researcher an electronic file that included the survey data. The researcher analyzed data using IBM SPSS software, version 28.

Instrumentation and Operationalization of Constructs

The survey within this study included 106 questions from three published instruments, and nine utilized the Technostress Creators' Instrument (Tarafdar et al.,

2007) to measure the technostress of ICT employees. The FRLT model utilized the

Multifactor Leadership Questionnaire (MLQ)-5X rater form and included

transformational, transactional, and passive avoidance leadership styles (Bass & Avolio,

2004). Job satisfaction utilized the Job Satisfaction Survey (JSS) and measured the job

satisfaction of ICT employees (Spector, 1985b). The appendices included the permission

letters for each instrument in the study.

Technostress Creators Instrument

The Technostress Creators instrument measures the technostress of ICT

employees and includes 23 items as listed in Appendix B. The instrument provided data

for the independent variable. Tarafdar et al. (2007) created the Technostress Creators'

instrument to measure technostress among users of ICT devices. The author provided

written permission to use the technostress instrument as listed in Appendix B. Appendix

C included the items from the Technostress Creators' instrument. Research participants

non-management employees who rate their level of technostress while utilizing ICT

based on a five-point Likert scale: 0 = *not applicable* or *I do not know*, 1 = *strongly*

disagree, 2 = *disagree moderately*, 3 = *disagree slightly*, 4 = *agree slightly*, 5 = *strongly*

agree (Tarafdar et al., 2007).

The Technostress Creators' (TC) instrument measures the technostress of an

individual based on five factors: techno-overload, techno-invasion, techno-uncertainty,

techno-complexity, and techno-insecurity (Ragu-Nathan et al., 2008). The techno-

overload factor is measured by responses to Questions 1, 2, 3, 4, and 5 of the technostress

creator's instrument. The techno-invasion factor is measured by responses to Questions 8,

9, 10, and 11 of the technostress creator's instrument. The techno-uncertainty factor is measured by responses to Questions 12, 13, 14, 15, and 16 of the technostress creator's instrument. Techno-complexity factor is measured by responses to Questions 17, 18, 19, 20, and 21 of the technostress creator's instrument. Techno-insecurity factor is measured by responses to Questions 22, 23, 24, and 25 of the technostress creators' instrument.

The Cronbach's alpha for the Technostress Creators' scale was 0.946 (F. Saleem et al., 2021). The Cronbach's alpha scores were above the recommended threshold of 0.70 (Gaudioso et al., 2017). Ragu-Nathan (2008) and Chen (2015) found the technostress instrument a valid and reliable tool based on its psychometric properties for Chinese knowledge workers.

The reliability factors for Chen's (2015) study on technostress ranged from 0.80 to 0.84 for the five technostress creator factors based on a sample size of 221 Chinese workers. Also, the reliability factors for Ragu-Nathan's (2008) study ranged from 0.77 to 0.83 for the five technostress creator factors based on a sample size of 608 participants. Both studies show that the Technostress Creators' instrument is reliable and valid. The constructs within this instrument relate to this study's framework as a measurement of ICT employee technostress due to rapidly changing technologies.

Multifactor Leadership Questionnaire (MLQ)-Form 5x Rater Instrument

The leadership style instrument will be the MLQ-5X rater form which included 45 items that cover transformational, transactional, and passive avoidance leadership styles divided across nine subscales (Bass & Avolio, 2004). The MLQ-Form-5x Rater instrument developer provided written permission to utilize the instrument for research

purposes, as listed in Appendix D. The dissertation could not include the verbatim MLQ instrument based on copyright constraints. However, some sample questions are listed in Appendix E. Mind Garden provided written permission to utilize the instrument. Bass and Avolio (2004) created the MLQ-5X to assess FRLT within the FRLT model. Research participants are non-management employees who rated their supervisor's leadership style while utilizing ICT based on a five-point Likert scale that included *0 (not at all)*, *1 (once in a while)*, *2 (sometimes)*, *3 (fairly often)*, *4 = (frequently, if not always)* (Bass & Avolio, 2004).

The MLQ-5X instrument included five scales (i.e., Idealized Attributes [IA], Idealized Behaviors [IB], Inspirational Motivation [IM], Intellectual Stimulation [IS], and Individual Consideration [IC]) that measure transformational leadership style (Bass & Avolio, 2004). The IA scale included items 10, 18, 21, and 25; the IB scale included Items 6, 14, 23, and 34 (Bass & Avolio, 2004). The IM scale items are 9, 13, 26, and 36, and the IS scale items are 2, 8, 30, and 32 (Bass & Avolio, 2004). Lastly, the IC scale items are 15, 19, 29, and 31 (Bass & Avolio, 2004). The MLQ-5X instrument included two scales (i.e., Contingent Rewards (CR) and Active Management-by-Exception (MBEA)) that measure the transactional leadership style (Bass & Avolio, 2004). The scale for the CR factor included items 1, 11, 16, and 35; the MBEA factor included items 4, 22, 24, and 27 (Bass & Avolio, 2004). The MLQ-5X instrument included two scales (i.e., Passive Management-by-Exception (MBEP) and Laissez-Faire (LF)) that measure passive-avoidant leadership style (Bass & Avolio, 2004). The scale for the MBEF factor included items 3, 12, 17, and 20, and the LF factor included items 5, 7, 28, and 33 (Bass

& Avolio, 2004). The MLQ-5X instrument included Extra Effort (EE), Effectiveness

(EFF), and Satisfaction (SAT) as three outcomes of leadership (Bass & Avolio, 2004).

The items related to the EE outcome are items 39, 42, and 44. The items related to the

EFF outcome are 37, 40, 43, and 45. The items associated with the SAT outcome are

items 38 and 41.

The MLQ instrument manual provided evidence for the reliability and validity of

the MLQ instrument. The reliability scores for the MLQ instrument ranged from 0.64 to

0.92 based on a sample size of 27285 participants within the United States (Bass &

Avolio, 2004). The coefficient alphas represented the MLQ instrument as a valid and

reliable tool. The constructs within this instrument relate to this study's framework as an

ICT employee rating of leadership style.

Instrument from JSS

Spector (1985a) fashioned the JSS to measure employee job satisfaction. The

developer of the JSS instrument provided written permission to utilize the instrument for

research purposes, as listed in Appendix F. Appendix G included the JSS instrument. The

job satisfaction instrument included 36 items with nine factors (Spector, 1985a). The nine

factors within the JSS instrument included pay, promotion, supervision, benefits,

contingent rewards, operating procedures, coworkers, nature of work, and

communication (Spector, 1985a).

The JSS instrument included a 6-point Likert scale (Spector, 1985a). The sample

included non-management employees who rated job satisfaction based on a six-point

Likert scale: 1 = *disagree very much*, 2 = *disagree moderately*, 3 = *disagree slightly*, 4 =

agree slightly, 5 = *agree moderately*, 6 = *agree very much* (Spector, 1985b). Job

satisfaction represents the average score based on negatively worded questions across the

nine factors. Based on the scoring of the JSS items for a six-item scale, each score can

range from 36 to 216 (Spector, 1985b). Spector (1994) indicated the final JSS scoring

would have one of three designations: (a) dissatisfaction (i.e., scores range from 36 to

108), (b) ambivalent (i.e., scores range from (i.e., scores range from 108 to 144), and (c)

satisfaction (i.e., scores range from 144 to 216).

The JSS instrument has nine factors: pay, promotion, supervision, fringe benefits,

contingent rewards, operating conditions, coworkers, nature of work, and communication

(Spector, 1985b). The pay scale included Items 1, 10, 19, and 28 (Spector, 1985b). The

promotion scale included Items 2, 11, 20, and 33 (Spector, 1985b). The supervision scale

included Items 3, 12, 21, and 30 (Spector, 1985b). The fringe benefits scale included

Items 4, 13, 22, and 29 (Spector, 1985b). The contingent rewards scale included Items 5,

14, 23, and 32 (Spector, 1985b). The operating conditions scale included Items 6, 15, 24,

and 31 (Spector, 1985b). The coworker's scale included Items 7, 16, 25, and 34 (Spector,

1985b). The nature of the work scale included Items 8, 17, 27, and 35. Lastly, the

communications scale included Items 9, 18, 26, and 36 (Spector, 1985b).

Several studies provided evidence of the reliability and validity of the JSS

instrument. The JSS instrument had a reliability score of 0.895 (Dhamija et al., 2019).

Ogunkuade & Ojiji (2018) had a reliability score 0.98 for job satisfaction. Tsounis and

Sarafis (2018) included reliability scores from 0.60 to 0.82 based on a sample size of

2870 participants. Both studies show that the JSS instrument is reliable and valid. The

constructs within this instrument relate to this study's framework to measure employee

job satisfaction based on technostress and employee rating of leadership style.

Data Analysis Plan

The imported data were analyzed using IBM Statistical Package for the Social

Sciences (SPSS) 28 to test hypotheses based on descriptive statistics, correlation,

multiple linear regression (MLR), and moderated regression analyses. The data analysis

plan included cleaning and screening any incomplete data. The data analysis included

MLR analyses and moderated regression analyses to answer the research questions of this

study.

Research Questions

The research questions and hypotheses are as follows:

RQ1:   To what extent does technostress determine employee job satisfaction

among ICT employees?

H_01_1: Technostress has no significant negative impact on ICT employee job

satisfaction.

H_11_1: Technostress has a significant negative impact on ICT employee job

satisfaction.

H_01_2: Technostress has no significant positive impact on ICT employee job

satisfaction.

H_11_2: Technostress has a significant positive impact on ICT employee job

satisfaction.

RQ$_2$: To what extent do leadership styles determine employee job satisfaction among ICT employees?

H_02_1: Transformational leadership has no significant positive impact on ICT employee job satisfaction.

H_12_1: Transformational leadership has a significant positive impact on ICT employee job satisfaction.

H_02_2: Transformational leadership has no significant negative impact on ICT employee job satisfaction.

H_12_2: Transformational leadership has significant negative impacts on ICT employee job satisfaction.

H_02_3: Transactional leadership has no significant negative impacts on ICT employee job satisfaction.

H_12_3: Transactional leadership has a significant negative impact on ICT employee job satisfaction.

H_02_4: Transactional leadership has no significant positive impact on ICT employee job satisfaction.

H_12_4: Transactional leadership has a significant positive impact on ICT employee job satisfaction.

H_02_5: Laissez-faire leadership has no significant negative impact on ICT employee job satisfaction.

H_12_5: Laissez-faire leadership has a significant negative impact on ICT employee job satisfaction.

H_02_6: Laissez-faire leadership has no significant positive impact on ICT employee job satisfaction.

H_12_6: Laissez-faire leadership has a significant positive impact on ICT employee job satisfaction.

RQ3: As the correlation of leadership style increases, to what extent does the relationship between technostress and ICT employee job satisfaction increase or decrease?

H_03_1: As the correlation of transformational leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.

H_13_1: As the correlation of transformational leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.

H_03_2: As the correlation of transactional leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.

H_13_2: As the correlation of transactional leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.

H_03_3: As the correlation of laissez-faire leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction will increase.

H_13_3: As the correlation of laissez-faire leadership increases, the negative relationship between technostress and ICT employee job satisfaction will increase.

Statistical Tests

The data analysis of this study included both descriptive and inferential statistics. The descriptive analysis would include descriptive statistics to delineate the sample population. This study's inferential statistics included MLR, correlation, and moderated regression analysis.

Descriptive Analysis

The descriptive analysis included a description of the sample. The sample description included demographical variables such as gender, ethnicity, age, education level, and income. The other statistical analyses included means, minimums, maximums, and standard deviations that descriptively depicted the sample.

Correlation Analysis

This study included Pearson's correlation analysis as a hypothesis test. DeLay and Clark (2020) indicated that the Pearson correlation analysis could assess the strength and direction of statistically significant relationships between variables and indicate the effect size of relationships. A Pearson's correlation must meet five assumptions: (a) include at least two continuous variables, (b) paired continuous variables, (c) linearity between variables, (d) no significant outliers, and (e) bivariate normality (Laerd Statistics, 2021b). Coefficients from correlation analysis can vary between 0.1 and 0.5 to indicate small, medium, or large effect sizes (DeLay & Clark, 2020). Coefficients ranging from 0.1 to 0.29 represent a small effect size, while coefficients ranging from 0.3 to 0.49 represent a medium effect size (DeLay & Clark, 2020). Coefficients greater than 0.50 represented a large effect size (DeLay & Clark, 2020).

Multiple Linear Regression Analysis

The MLR analysis included the satisfaction of eight assumptions, with two primary assumptions relating to having one continuous dependent variable and at least two continuous independent variables (Laerd Statistics, 2021a). The first assumption of MLR analysis was related to having one dependent variable with a continuous level of measurement (Laerd Statistics, 2021a). This study included the job satisfaction of ICT employees as a dependent variable with a continuous level of measurement. The second assumption of MLR analysis was related to having two or more independent variables with either a continuous or nominal level of measurement (Laerd Statistics, 2021a). This study included the technostress of ICT employees and the leadership styles of an ICT employee's supervisor as two independent variables with continuous levels of measurement. The remaining six MLR assumptions included the independence of observations, linearity, homoscedasticity, multicollinearity, unusual points, and normality (Laerd Statistics, 2021a).

Research question 1 included an MLR analysis as a hypothesis test. This research question utilized MLR analysis to assess the relationship between the five factors of technostress as measured by the Technostress Creators' instrument (Tarafdar et al., 2007) and the six factors of job satisfaction (supervision, contingent rewards, operating procedures, coworkers, nature of work, and communication) as measured the JSS instrument (Spector, 1985b). The MLR model is $Y = b_0 + bX_1$, where Y is employee job satisfaction, and X_1 is technostress. MLR analyses would be statistically significant if the probability values (i.e., p-values) of the model are less than 0.05 (e.g., $p < 0.05$) between

the technostress and employee job satisfaction. In this case, this statistical test would provide evidence against the null hypothesis. MLR analyses would not be statistically significant if the p-values of the model are higher than 0.05 (e.g., $p > 0.05$) between the technostress and employee job satisfaction. In this case, this statistical test would fail to provide evidence against the null hypothesis.

Research question 2 included an MLR analysis as a hypothesis test. This research question utilized MLR analysis to assess the relationship between the three leadership styles (i.e., transformational, transactional, and laissez-faire) as measured by the MLQ-5x instrument (Bass & Avolio, 2004) and the six factors of job satisfaction (supervision, contingent rewards, operating procedures, coworkers, nature of work, and communication) as measured the JSS instrument (Spector, 1985b). The MLR model is $Y = b_0 + b_1 X_2 + b_2 X_3 + b_3 X_4$, where Y was employee job satisfaction, X_2 was transformational leadership, X_3 was transactional leadership, and X_4 was laissez-faire leadership. MLR analyses would be statistically significant if the probability values of the model are less than 0.05 (e.g., $p < 0.05$) between the FRLT styles and employee job satisfaction. In this case, this statistical test would provide evidence against the null hypothesis. MLR analyses would not be statistically significant if the p-values of the model were higher than 0.05 (e.g., $p > 0.05$) between FRLT and employee job satisfaction. In this case, this statistical test would fail to provide evidence against the null hypothesis.

Moderated Regression

Research question 3 included a moderated regression analysis as a hypothesis test. The research question will utilize hierarchical multiple regression to examine whether three leadership styles moderate the relationship between technostress and job satisfaction. This research question will utilize moderated regression analysis to assess the extent of the relationship between technostress and ICT employee job satisfaction increases or decreases as the correlation of leadership style increases. The MLR model is $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_1X_2 + b_6X_1X_3 + b_7X_1X_4$ where X_1 is technostress, X_2 is transformational leadership, X_3 is transactional leadership, and X_4 is laissez-faire leadership. The moderate regression analysis would be statistically significant if the p-values of the interaction terms in the model were less than 0.05 (e.g., $p < 0.05$). The regression analysis would provide evidence against the null hypothesis. If the p-value is less than or equal to the selected significance level ($p > 0.05$), the effect for the interaction term would not be statistically significant. The regression analysis would fail to provide evidence against the null hypothesis.

Threats to Validity

External Validity

External validity is a critical aspect of a research methodology because threats to external validity can weaken the results of a study. One threat to external validity was purposive sampling due to biases toward a random sample. The possible mitigation was the accurate delineation of inclusion criteria for surveys. Creswell and Creswell (2018) indicated that external validity occurs when research obtains incorrect inferences from

sample data and applies those incorrect inferences to other populations within different settings. Burkholder et al. (2016) indicated that external validity describes how study results remain true in other populations and contexts. Ferguson (2004) indicated that researchers could maximize a study's external validity or generalizability by incorporating a random selection of participants into a research design methodology. The definition of external validity from Burkholder et al. (2016) and Creswell and Creswell (2018) are in alignment with Ferguson's (2004) definition of described external validity. The authors concurred that the principal threat to external validity is the generalizability of the sample data to other populations.

Internal Validity

Internal validity is an essential circumstance of a research methodology because threats to internal validity can weaken the results of a study. Creswell and Creswell (2018) provided an overview of threats to internal validity: (a) history, (b) maturation, (c) testing, (d) instrumentation, (e) statistical regression, (f) researcher bias, (g) selection, (h) overall mortality, and (i) differential mortality. Burkholder et al. (2016) described internal validity as a measure of valid inference. Burkholder et al. (2016) agreed with the approach from Creswell and Creswell (2018) regarding the definition of described internal validity. The potential threats to internal validity that may arise in this study include (a) instrumentation, (b) selection, (c) and overall mortality. These threats to internal validity are critical to consider because they can affect whether an associated inference of a study is valid. The instrumentation threat could affect the internal validity of this study. The participant selection threat could affect the internal validity of this

study. Creswell and Creswell (2018) indicated that the selection threat refers to selecting prospective participants with associated attributes that influence them to have a specific effect, and the researchers stated that potential mitigation is to have a randomized selection process. The mortality threat can affect the internal validity of this study. Creswell and Creswell (2018) indicated the mortality threat described when participants drop out of a study, and the researchers indicated that potential mitigation is to obtain more participants that can account for dropouts.

Construct Validity

Construct validity is a critical aspect of a research methodology because threats to construct validity can weaken the results of a study. One threat to construct validity was that technostress, MLQ, and JSS instruments would need to measure the associated constructs consistently. Creswell and Creswell (2018) indicated that construct validity represents how instruments measure constructs or concepts. Burkholder et al. (2016) stated that construct validity represents how survey instruments correctly operationalize constructs or ideas within a study.

The analysis included all the factors from the independent (i.e., technostress), moderating (i.e., leadership style), and dependent variables (i.e., job satisfaction). The measure of technostress, the Technostress Creators' scale, is an existing and validated instrument. The independent variable, technostress, has five factors: techno-invasion, techno-complexity, techno-insecurity, techno-uncertainty, and techno-overload (Tarafdar et al., 2007). The constructs within this instrument are related to this study's framework as a measurement of ICT employee technostress due to rapidly changing technologies.

The measure of leadership styles, the MLQ-5x instrument, is an existing and validated instrument. The FRLT model has nine factors encompassing transformational, transactional, and laissez-faire (i.e., passive avoidant) leadership styles (Bass & Avolio, 2004). Transformational leadership has five factors: idealized attributes, idealized behaviors, individualized consideration, intellectual stimulation, and inspirational motivation (Bass & Avolio, 2004). Bass and Avolio (2004) espoused that transactional leadership has contingent rewards and active management-by-exception, and passive avoidant leadership has two factors: passive management-by-exception and laissez-faire. The constructs within this instrument relate to this study's framework as an ICT employee rating of leadership style.

The measure of job satisfaction, the JSS instrument, had an existing and validated instrument. The dependent variable, job satisfaction, has nine factors: pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, and communication (Spector, 1985a). The constructs within this instrument related to this study's framework to measure employee job satisfaction based on technostress and employee rating of leadership style. All instruments had good reliability scores (i.e., Cronbach's alphas) for the associated instruments. The elements aligned with the intended variables of the study in measuring employee technostress, employee rating of leadership style, and employee job satisfaction within the context of ICT technologies.

Ethical Procedures

This study aimed to protect prospective volunteers' rights and privacy. Before beginning data collection, I submitted the required documents to Walden University's

Institution Review Board (IRB). The recruitment process began after receiving final

authorization to solicit research participants from the online survey administrator,

Qualtrics®.

The prospective participant agreed to informed consent when the participant

clicked the agreement button on the informed consent page of the survey. Creswell and

Creswell (2018) stated that volunteers should sign informed consent forms indicating an

agreement to acknowledge the protection of human rights for the prospective participants.

The informed consent form included verbiage that states the participant can withdraw

participation without loss or penalty. The survey administrator, Qualtrics®, hosted the

survey questions to their participant pool. Each prospective participant had the

opportunity to review the purpose of the study and an informed consent form and provide

affirmation for informed consent accordingly.

Qualtrics® will not provide any personal information or identifiable data to the

researcher. To safeguard data, the researcher kept any complete or incomplete surveys on

a password-protected computer. The researcher will retain any research data (e.g., survey

data and data analysis) for 5 years. The researcher will discard any survey records after 5

years and only keep the data set for future research.

Summary

The study had a nonexperimental, quantitative, and correlational research design.

Qualtrics® will collect the data from the prospective survey participants based on

demographic data, Technostress Creators, MLQ-5X Short, and the JSS instrument. The

study included data from ICT employees in the United States. The study needed at least

107 volunteers (N=107) to achieve generalizability.

Chapter 4: Results

This quantitative correlational study examined the role of leadership styles between technostress and employee job satisfaction. The following were the research questions and hypotheses for the study:

RQ$_1$: To what extent does technostress determine employee job satisfaction among ICT employees?

H$_0$1$_1$: Technostress has no significant and negative impact on ICT employee job satisfaction.

H$_1$1$_1$: Technostress has a significant and negative impact on ICT employee job satisfaction.

H$_0$1$_2$: Technostress has no significant and positive impact on ICT employee job satisfaction.

H$_1$1$_2$: Technostress has a significant and positive impact on ICT employee job satisfaction.

RQ$_2$: To what extent do leadership styles determine employee job satisfaction among ICT employees?

H$_0$2$_1$: Transformational leadership has no significant and positive impact on ICT employee job satisfaction.

H$_1$2$_1$: Transformational leadership has a significant and positive impact on ICT employee job satisfaction.

H$_0$2$_2$: Transformational leadership has no significant and negative impact on ICT employee job satisfaction.

H_12_2: Transformational leadership has a significant and negative impact on ICT employee job satisfaction.

H_02_3: Transactional leadership has no significant and negative impact on ICT employee job satisfaction.

H_12_3: Transactional leadership has a significant and negative impact on ICT employee job satisfaction.

H_02_4: Transactional leadership has no significant and positive impact on ICT employee job satisfaction.

H_12_4: Transactional leadership has a significant and positive impact on ICT employee job satisfaction.

H_02_5: Laissez-faire leadership has no significant and negative impact on ICT employee job satisfaction.

H_12_5: Laissez-faire leadership has a significant and negative impact on ICT employee job satisfaction.

H_02_6: Laissez-faire leadership has no significant and positive impact on ICT employee job satisfaction.

H_12_6: Laissez-faire leadership has a significant and positive impact on ICT employee job satisfaction.

RQ_3: As the correlation of leadership style increases, to what extent does the relationship between technostress and ICT employee job satisfaction increase or decrease?

H_031: As the correlation of transformational leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.

H_131: As the correlation of transformational leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.

H_032: As the correlation of transactional leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.

H_132: As the correlation of transactional leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.

H_033: As the correlation of laissez-faire leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction will increase.

H_133: As the correlation of laissez-faire leadership increases, the negative relationship between technostress and ICT employee job satisfaction will increase.

Chapter 4 included the data collection timeframe, recruitment, and response rates. The study included any discrepancies between the data collection plan and the data collection. The study included descriptive statistics, assumptions, and analysis findings.

The statistical results are provided and evaluated in tables and figures. A summary of the chapter is provided as a transition to Chapter 5.

Data Collection

This section of Chapter 4 included information about participant recruitment, response rate, and data collection time. The section also included any discrepancies between the data collection plan outlined in Chapter 3 and the implemented data collection. The study included the results and statistical analyses and answered previously stated research questions.

Data Collection and Discrepancies

Data collection began after the Walden University IRB granted permission to collect data, Approval # 01-12-23-0137128. On January 12, 2023, the Walden IRB approved the study survey for data collection. Individuals who met the inclusion criteria received an invitation to participate in the questionnaire. After programming the survey on the Qualtrics platform, I sent an anonymous survey link to the Qualtrics survey administrators for survey distribution. Data collection for this study started on January 27, 2023, and ended on February 2, 2023. One hundred eighteen participants from the Qualtrics panel audience answered all the survey questions. Regarding the statistical power analysis, I needed 107 participants, and the final number of completed responses (N=118) exceeded the minimum sample size. Qualtrics sent out a total number of 1240 invitations, from which 118 participants completed the survey. The response rate was 10%. After completing the data collection, I logged on to the password-protected website of Qualtrics to view and export the data. The response data were exported to password-

protected SPSS and Excel files on a password-protected computer. I used data within the SPSS file to perform the data analysis for the study. No discrepancies exist between the data collection outcome and the data collection plan outlined in Chapter 3.

Descriptive Analysis of Sample Demographics

Participants in the survey were asked five demographical questions:

- What is your gender?

- What is your ethnicity?

- What is your age?

- What is your highest level of education?

- What is your annual income?

I performed descriptive statistics using SPSS to calculate means, variances, and standard deviations of the characteristics of each demographic variable. Using SPSS 28 to conduct data analysis, I evaluated the demographic data of the 118 participants. However, the final participant count was 116 participants due to outliers. Regarding gender, 71 males (61.2%) and 45 females (38.8%) participated in the survey. Gender responses of Other were provided to participants, but none self-identified with this response.

The ethnicity of the participants is in Table 1, including the following: three (3) American Indians (2.6%), eight (8) Asians (6.9%), 19 Black Americans (16.4%), seven (7) Hispanic (6.0%), 77 White (66.4%), and two (2) who identified as Other (1.7%). The results of the demographics analysis indicated that most participants were White (61.2%).

The age range of participants is in Table 1. The survey participants included nine participants (8.2%) between 18 to 26 years old, 39 participants (35.5%) between 27 to 35 years old, 44 participants (40%) between 36 to 44 years old, 12 participants (10.9%) between 45 to 53 years old, and three participants (2.7%) between 54 and 62 years old. Three participants (2.7%) were greater than 62 years old.

The participants' highest level of education is in Table 1. The highest level of education included the following: one participant (0.9%) had no schooling, 11 participants (9.5%) with a High School education, 18 participants (15.5%) who attended 2 years of college, 57 (49.1%) participants had a bachelor's degree, and 29 participants (25.0%) had a master's degree. No participants reported having Other" highest levels of education.

The participants' annual income ranged from less than $ 25,000 to over $125,000, listed in Table 1. The participants' annual income included the following: two participants (1.7%) earning less than $25,000, 13 participants (12.2%) earning between $25,000 and $49,999, 28 participants (24.1%) earning $50,000 and $74,999, 29 participants (25.0%) earning between $75,000 and $99,999, 19 participants (16.4%) earning between $100,000 and $124,999. Lastly, 25 participants (21.6%) earned greater than $125,000. The results of the demographics analysis indicated that most participants were male (61.2%), White (66.4%), between the ages of 36 to 44 (40.0%), that held bachelor's degrees (49.1%) with annual incomes between $50,000 and $99,999 (24.1%).

Table 1

Sample Demographics Characteristics Table

Characteristic	*n*	Percent
Gender		
Male	71	61.2%
Female	45	38.8%
Ethnicity		
American Indian	3	2.6%
Asian	8	6.9%
Black or African American	19	16.4%
Hispanic	7	6.0%
White	77	66.4%
Other	2	1.7%
Age		
18-26	9	8.2%
27-35	39	35.5%
36-44	44	40.0%
45-53	12	10.9%
54-62	3	2.7%
>62	3	2.7%
Education		
No school	1	0.9%
High School	11	9.5%
Two-year college	18	15.5%
Bachelor's degree	57	49.1%
Master's degree	29	25.0%
Other	0	0.0%
Annual Income		
< $25,000	2	1.7%
$25,000 - $49,999	13	12.2%
$50,000 - $74,999	28	24.1%
$75,000 - $99,999	29	25.0%
$100,000 - $124,999	19	16.4%
>$125,000	25	21.6%

Note. N = 116

Qualtrics administered three surveys to participants for this research: technostress creators, MLQ-5X, and the JSS. Composite scores were developed by computing the average of the items within each scale. In Table 2, the Technostress Creator mean scores ranged from 0.00 to 5.00, with $M = 3.12$ and $SD = 0.84$. Transformational leadership

mean scores ranged from 0.00 to 3.00, with $M = 2.02$ and $SD = 0.50$. The transactional

leadership mean scores ranged from 0.00 to 3.00, with $M = 1.94$ and $SD = 0.52$. The

passive avoidant leadership mean scores ranged from 0.00 to 2.90, with $M = 1.43$ and SD

$= 0.76$. The job satisfaction means scores ranged from 1.00 to 5.94, with $M = 3.83$ and

$SD = 0.68$.

Table 2

Descriptive Statistics of Continuous Independent and Dependent Variables

Variables	Min	Max	M	SD
Technostress Creators	0.00	5.00	3.12	0.84
Transformational Leadership	0.00	3.00	2.02	0.50
Transactional Leadership	0.00	3.00	1.94	0.52
Passive Avoidant Leadership	0.00	2.90	1.43	0.76
Job Satisfaction	1.00	5.94	3.83	0.68

Note. N = 116, M = Mean, SD = Standard Deviation

Descriptive Statistics for Independent Variable (Technostress and Dimensions)

The Technostress Creators' instrument measures the independent variable,

technostress, and includes 23 items. Tarafdar et al. (2007) created the Technostress

Creators' instrument to measure technostress among users of ICT devices. The

Technostress Creators (TC) instrument measures the technostress of an individual based

on five factors: techno-overload, techno-invasion, techno-uncertainty, techno-complexity,

and techno-insecurity (Ragu-Nathan et al., 2008). Research participants non-management

employees who rate their level of technostress while utilizing ICT based on a five-point

Likert scale: *0 = "not applicable" or "I do not know," 1 = "strongly disagree," 2 =*

"disagree moderately," 3 = "disagree slightly," 4 = "agree slightly," 5 = "strongly agree"

(Tarafdar et al., 2007).

Table 3 shows the overall mean for technostress score was 3.12, which implied

that the research participants in the sample slightly disagreed with having technostress.

For the current research, the Cronbach's alpha coefficient for the technostress scale

equaled 0.946 based on 23 items. Creswell and Creswell (2018) stated that Cronbach's

alpha coefficients between 0.70 and 0.90 are optimal because it indicates adequate

intercorrelation between the instrument items. The technostress items did not include any

reverse scoring.

Table 3

Descriptive Statistics for Independent Variable (Technostress Creators)

Variables	Min	Max	M	SD	Cronbach's Alpha
Technostress Creators	0.00	5.00	3.12	0.84	0.946 (23 items)
Techno-Overload	0.00	5.00	3.31	1.03	0.867 (5 items)
Techno-Invasion	0.00	3.00	3.15	1.08	0.862 (4 items)
Techno-Complexity	0.00	5.00	2.51	1.14	0.915 (5 items)
Techno-Insecurity	0.00	5.00	2.83	1.06	0.866 (5 items)
Techno-Uncertainty	0.00	5.00	3.77	0.83	0.820 (4 items)

Note. N = 116, M = Mean, SD = Standard Deviation

Descriptive Statistics for Moderator Variables (Leadership Styles and Dimensions)

Table 4 shows the means, minimums, maximums, and standard deviations that

descriptively depicted the sample for leadership styles. The FRLT instrument was the

MLQ-5X rater form that included 45 items that cover transformational, transactional, and

passive avoidance leadership styles divided across nine subscales (Bass & Avolio, 2004).

As represented in the MLQ-5x rater instrument, transformational leadership styles are

idealized attributes and behaviors, inspirational motivation, intellectual stimulation, and

individual consideration. The MLQ-5X instrument included five scales (i.e., Idealized

Attributes (IA), Idealized Behaviors (IB), Inspirational Motivation (IM), Intellectual

Stimulation (IS), and Individual Consideration (IC)) that measure transformational

leadership style (Bass & Avolio, 2004). Research participants are non-management

employees who rated their supervisor's leadership style while utilizing ICT based on a

five-point Likert scale that included *0 (not at all)*, *1 (once in a while)*, *2 (sometimes)*, *3*

(fairly often), *4 = (frequently, if not always)* (Bass & Avolio, 2004). For the current

research, the Cronbach's alpha coefficient for the MLQ-5x rater scale ranged from 0.80

to 0.93. Creswell and Creswell (2018) stated that Cronbach's alpha coefficients between

0.70 and 0.90 are optimal because it indicates adequate intercorrelation between the

instrument items. The items did not include any reverse scoring.

Table 4

Descriptive Statistics for Moderator Variables (MLQ-5x Rater Instrument and Dimensions)

Variables	Min	Max	M	SD	Cronbach's Alpha
Transformational Leadership Style	0.00	3.00	2.02	0.50	20 items (0.929)
Idealized Attributes	0.00	3.20	2.08	0.56	
Idealized Behaviors	0.00	3.20	1.99	0.60	
Inspirational Motivation	0.00	3.20	2.16	0.59	
Intellectual Stimulation	0.00	3.00	1.93	0.57	
Individual Consideration	0.00	3.20	1.95	0.56	
Transactional Leadership Style	0.00	3.00	1.94	0.52	8 items (0.809)
Contingent Rewards	0.00	3.20	2.06	0.52	
Active Management-by-Exception	0.00	3.20	1.83	0.64	
Passive Avoidant Leadership Style	0.00	2.90	1.43	0.76	8 items (0.897)
Passive Management-by-Exception	0.00	3.20	1.54	0.79	
Laissez-Faire	0.00	2.80	1.33	0.82	

Note. N = 116, M = Mean, SD = Standard Deviation

Descriptive Statistics for Dependent Variable (Job Satisfaction Survey and

Dimensions)

Table 5 shows the means, minimums, maximums, and standard deviations that

descriptively depicted the sample for job satisfaction. Job satisfaction utilized the Job

Satisfaction Survey (JSS) and measured the job satisfaction of ICT employees (Spector,

1985b). JSS included 36 items with nine factors (Spector, 1985a). The nine factors within

the JSS instrument included pay, promotion, supervision, benefits, contingent rewards,

operating procedures, coworkers, nature of work, and communication (Spector, 1985a).

The JSS instrument included a 6-point Likert scale (Spector, 1985a). Research

participants who are non-management employees who rate their level of job satisfaction

based on a six-point Likert scale: *1 = "disagree very much," 2 = "disagree moderately,"*

3 = "disagree slightly," 4 = "agree slightly," 5 = "agree moderately," 6 = "agree very

much" (Spector, 1985b). For the current research, the Cronbach's alpha coefficient for

the job satisfaction survey scale equaled 0.91. Creswell and Creswell (2018) stated that

Cronbach's alpha coefficients between 0.70 and 0.90 are optimal because it indicates

adequate intercorrelation between the instrument items. In Table 5, the means between 3

and 4 represent ambivalence or mixed feelings toward job satisfaction and dissatisfaction.

The items included reverse scoring.

Table 5

Descriptive Statistics for Dependent Variable (Job Satisfaction Survey and Dimensions)

Variable and Dimensions	Min	Max	M	SD	Cronbach's Alpha
Job Satisfaction	1.00	5.94	3.83	0.68	36 items (0.909)
Pay	1.00	6.00	3.98	0.78	
Promotion	1.00	6.00	4.11	0.78	
Supervision	1.00	6.00	3.80	0.86	
Fringe Benefits	1.00	5.75	3.91	0.71	
Contingent Rewards	1.00	6.00	3.43	0.98	
Operating Conditions	1.00	6.00	3.56	1.14	
Coworkers	1.00	6.00	3.99	0.78	
Nature of Work	1.00	5.75	4.26	0.73	
Communication	1.00	6.00	3.45	1.04	

Note. N = 116, M = Mean, SD = Standard Deviation

Study Results

Research Question 1 and Hypotheses

RQ_1: To what extent does technostress determine employee job satisfaction among ICT employees?

H_01_1: Technostress has no significant and negative impact on ICT employee job satisfaction.

H_11_1: Technostress has a significant and negative impact on ICT employee job satisfaction.

H_01_2: Technostress has no significant and positive impact on ICT employee job satisfaction.

H_11_2: Technostress has a significant and positive impact on ICT employee job satisfaction.

Hypothesis Testing for Research Question 1

Technostress

As with the first research question, the first step in a multiple linear regression (MLR) analysis is assessing the eligibility of eight assumptions. Within the eight assumptions, the two primary assumptions have (a) one continuous dependent variable and (b) at two least continuous two independent variables. The remaining assumptions include (1) independence of observations, (2) linearity, (3) homoscedasticity, (4) no multicollinearity, (5) no unusual points (i.e., outliers, leverage, or influential points), and (6) normality (Laerd Statistics, 2015).

The first assumption was whether the study included a continuous dependent variable. The dependent variable included a scale level of measurement measured by the JSS instrument. The second assumption was whether the study included at least two independent variables. Technostress included five dimensions which are (a) techno-overload, (b) techno-invasion, (c) techno-uncertainty, (d) techno-complexity, and (e) techno-insecurity. The existence of the continuous dependent and independent variables does not violate the first and second assumptions of an MLR analysis.

The third assumption was whether the study's data has independence of observations (i.e., independence of residuals). The Durbin-Watson statistic can assess the independence of residuals. The Durbin-Watson statistic can assess the independence of the residuals (Laerd Statistics, 2015). The Durbin-Watson statistic ranges from 0 to 4, and a value close to 2 indicates no correlation between residuals (Laerd Statistics, 2015). Residuals were independent, as assessed by a Durbin-Watson statistic of 2.349 and

shown in Table **7**. This observation ensured no violations for the assumption of independence of errors.

The fourth assumption was whether a linear relationship existed between (a) the dependent variable and the independent variables individually and (b) the dependent variable and the independent variable collectively. According to Laerd Statistics (2015), a scatterplot of the studentized residuals against the unstandardized (i.e., predicted) values can collectively assess linearity between the dependent and independent variables. . **Figure 2** meets this criterion for the linearity assumption between the dependent and independent variables.

The fifth assumption was whether the data showed homoscedasticity of residuals (i.e., equal error variances). According to Laerd Statistics (2015), visual inspection of the randomly scattered residuals can ensure no violation of the assumption of homoscedasticity of residuals. There was homoscedasticity, as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values in Figure 2. **Figure 2** met the assumption of homoscedasticity for an MLR analysis.

Figure 2

Scatter Plot of Studentized Residual by Unstandardized Predicted Value (Technostress and Job Satisfaction)
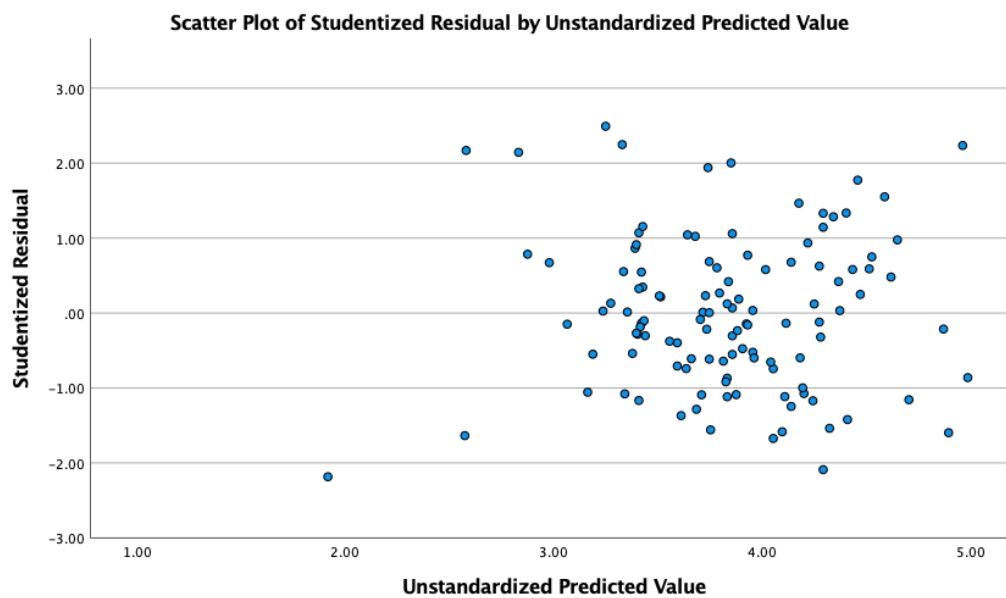
Figure 3

Histogram (Technostress and Job Satisfaction)
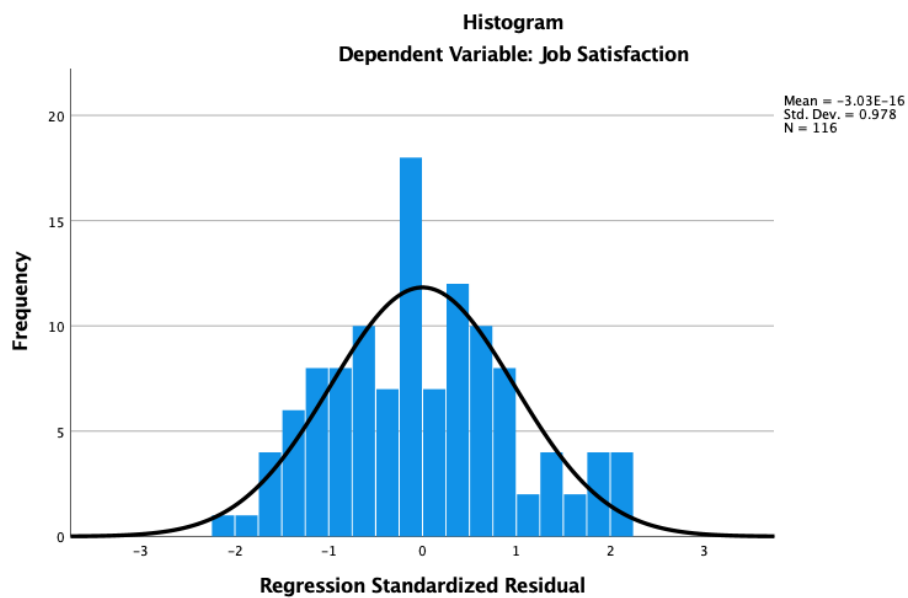
Figure 4

Normal P-P Plot
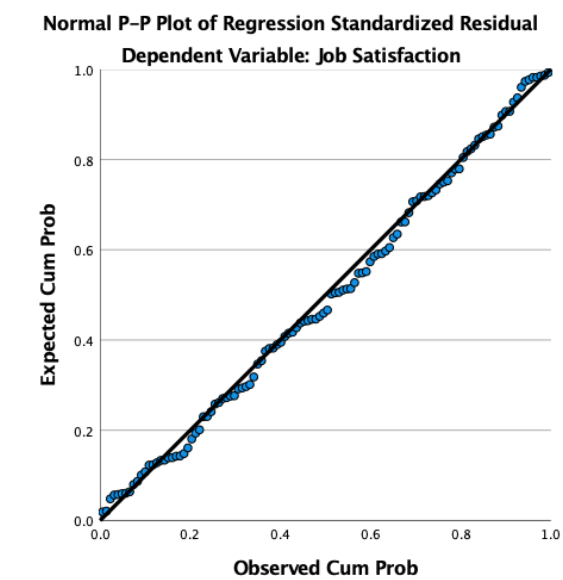
The sixth assumption was whether the data did not show multicollinearity. Laerd Statistics (2015) stated that VIF values above 10 indicate potential multicollinearity concerns. All VIF values were less than ten, as shown in Table 9. The data output met the MLR assumption of no multicollinearity within the data.

In Table 6, the seventh assumption was that the data had any unusual points (i.e., significant outliers, leverage, or influential points). The initial data analysis included one outlier that was removed. This circumstance changed the total number of participants from 118 to 116. No different SPSS output violated the outlier assumption based on the ±3 standard deviation threshold for the MLR analysis. The dataset's studentized deleted residuals (SDR) were not greater than ±3 standard deviations. The assessment of leverage points in SPSS considers values less than 0.2 as low leverage points and values greater than 0.5 as high leverage points that can be problematic within the data set (Laerd Statistics, 2015). All values were less than 0.5, which means the data had no leverage points. The Cook's distance values indicated any influential points in the data. SPSS stored the values for each case in the data. All values were less than 1, which means the data had no influential points. The data output met the MLR assumption of no unusual points, as shown in Table 6.

Table 6

Leverage Values and Influential Points

	Min	Max	M	SD	N
Cook's Distance	.000	.353	.014	.039	116
Centered Leverage Value	.000	.120	.009	.015	116

Note. $N = 116$; M = Mean; *SD* = Standard Deviation

The eighth assumption was whether the data had a normal distribution. The assumption of normality of the residuals was assessed with a histogram with a superimposed standard curve in **Figure 3** and a P-P plot in Figure **4**, which were part of the MLR analysis. The data output met the MLR assumption of normality.

In Table **7**, the multiple correlation coefficient, 0.754, indicates a moderate to strong association level. The coefficient of determination (R^2) for the overall model was 0.569. The R^2 statistic indicated that technostress explained 56.9% of the variability of employee job satisfaction in the data sample. According to the analysis of variance (ANOVA) results, the independent variable had a significant effect on the dependent variable, as listed in Table 8.

Table 7

Model Summary for Overall Technostress

Model	R	R^2	SE	Durbin-Watson
1	.754	.569	.45016	2.349

Note. R^2 = coefficient of determination; SE = Standard Error of the Estimate; p = probability; [a] Dependent Variable: Job Satisfaction

Table 8

One-Way ANOVA for Job Satisfaction by Overall Technostress

	Model	SS	df	MS	F	p
1	Regression	30.467	1	30.467	150.347	<.001[b]
	Residual	23.101	114	.203		
	Total	53.568	115			

Note. SS = sum of squares; df = degree of freedom; MS = Mean Square; F = F distribution, p = probability; ANOVA = analysis of variance
Dependent Variable: Job Satisfaction

In Table 9, the multiple regression analysis was conducted for research question 1

for the overall technostress variable. The multiple regression model was statistically

significant in determining job satisfaction, F (1, 115) = 150.347, $p < .001$. The finding

indicated that the relationship between technostress and employee job satisfaction was

statistically significant at the $p < .001$ level. The regression coefficients and standard

errors are in Table 9. The regression equation is expressed in the following form:

$predicted\ (employee\ job\ satisfaction) = b_0 + (b_1 \times technostress) = 1.917 +$

$(0.614 \times technostress)$. The slope coefficient is positive, so increasing technostress

would increase employee job satisfaction. The results rejected the null hypotheses (H_011

and H_012) for research question 1.

Table 9

Coefficients for Job Satisfaction by Overall Technostress

		Unstandardized Coefficients		Standardized Coefficients				Collinearity Statistics	
	Model	B	SE	β	SE	t	p	Tolerance	VIF
1	(Constant)	1.917	.162			11.863	<.001		
	Technostress [b]	.614	.050	.754		12.262	<.001[***]	1.000	1.000

Note. Model = "Enter" method in SPSS Statistics; *B* = unstandardized regression coefficient; *B* = standard error of the coefficient; *β* = standardized coefficient; *p* = probability; R^2 = coefficient of determination; ns = not statistically significant; *VIF* = Variance Inflation Factor
[a] Dependent Variable: Job Satisfaction
[b] Independent Variables: Technostress
[*]$p < .05$, [**]$p < .01$, [***]$p < .001$.

Technostress Dimensions

As with the first research question, the first step in a multiple linear regression

(MLR) analysis is assessing the eligibility of eight assumptions. Within the eight

assumptions, the two primary assumptions have (a) one continuous dependent variable

and (b) at two least continuous two independent variables. The remaining assumptions

include (1) independence of observations, (2) linearity, (3) homoscedasticity, (4) no

multicollinearity, (5) no unusual points (i.e., outliers, leverage, or influential points), and

(6) normality (Laerd Statistics, 2015).

The first assumption was whether the study included a continuous dependent

variable. The dependent variable, employee job satisfaction, included a scale level of

measurement measured by the JSS instrument. The second assumption was whether the

study included at least two independent variables. The independent variable included five

dimensions which are (a) techno-overload, (b) techno-invasion, (c) techno-uncertainty,

(d) techno-complexity, and techno-insecurity. The existence of the continuous dependent

and independent variables does not violate the first and second assumptions of an MLR

analysis.

The third assumption was whether the study's data has independence of

observations (i.e., independence of residuals). The Durbin-Watson statistic can assess the

independence of residuals. The Durbin-Watson statistic can assess the independence of

the residuals (Laerd Statistics, 2015). The Durbin-Watson statistic ranges from 0 to 4, and

a value close to 2 indicates no correlation between residuals (Laerd Statistics, 2015).

Residuals were independent, as assessed by a Durbin-Watson statistic of 2.357 and

shown in Table 11. This observation ensured no violations for the assumption of

independence of errors.

The fourth assumption was whether a linear relationship existed between (a) the

dependent variable and the independent variables individually and (b) the dependent

variable and the independent variables collectively. According to Laerd Statistics (2015), a scatterplot of the studentized residuals against the unstandardized (i.e., predicted) values can collectively assess linearity between the dependent and independent variables. The scatter plot in Figure 5 collectively meets this criterion for the linearity assumption between the dependent and independent variables. The partial regression plots for job satisfaction by each technostress creator dimension (i.e., techno-overload, techno-invasion, techno-uncertainty, techno-complexity, and techno-insecurity) are shown in Figure 6 through Figure 10. Figure **6** through Figure 10 meet the criterion for the linearity assumption between the dependent and independent variables individually.

The fifth assumption was whether the data showed homoscedasticity of residuals (i.e., equal error variances). According to Laerd Statistics (2015), visual inspection of the randomly scattered residuals can ensure no violation of the assumption of homoscedasticity of residuals. There was homoscedasticity, as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values in Figure 5. The scatter plot in Figure 5 met the assumption of homoscedasticity for an MLR analysis.

Figure 5

Scatter Plot of Studentized Residual by Unstandardized Predicted Value (Technostress Dimensions and Job Satisfaction)

Scatter Plot of Studentized Residual by Unstandardized Predicted Value

The sixth assumption was whether the data did not show multicollinearity. Laerd Statistics (2015) stated that VIF values above 10 indicate potential multicollinearity concerns. All VIF values were less than ten, as shown in **Table 13**. The data output met the MLR assumption of no multicollinearity within the data.

The seventh assumption was that the data had any unusual points (i.e., significant outliers, leverage, or influential points). The initial data analysis included one outlier that was removed. This circumstance changed the total number of participants from 118 to 116. No different SPSS output violated the outlier assumption based on the ±3 standard deviation threshold for the MLR analysis. The dataset's studentized deleted residuals (SDR) were not greater than ±3 standard deviations. The assessment of leverage points in SPSS considers values less than 0.2 as low leverage points and values greater than 0.5 as

high leverage points that can be problematic within the data set (Laerd Statistics, 2015). All values were less than 0.5, which means the data had no leverage points. The Cook's distance values indicated any influential points in the data. SPSS stored the values for each case in the data. All values were less than 1, which means the data had no influential points. The data output met the MLR assumption of no unusual points.

Figure 6

Partial Regression Plot – Job Satisfaction by Techno-Overload Dimension
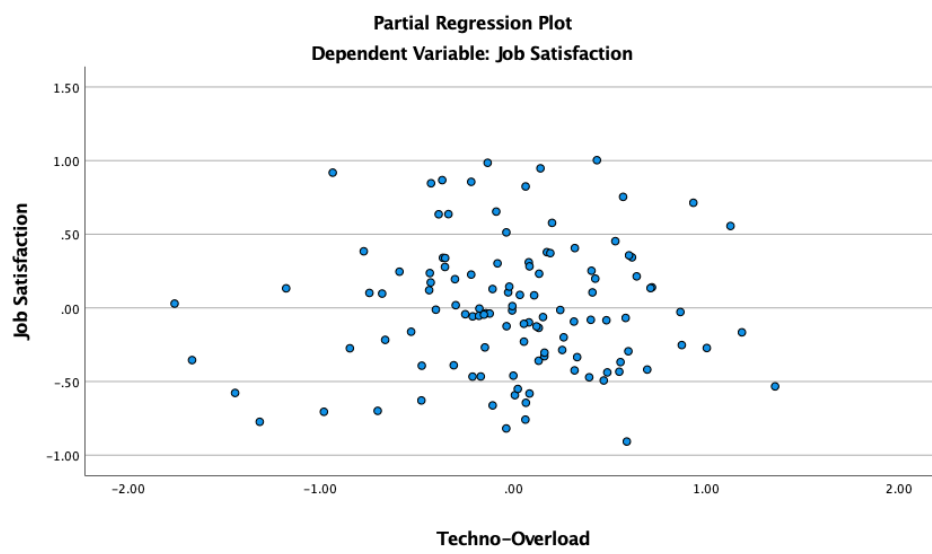
Figure 7

Partial Regression Plot – Job Satisfaction by Techno-Invasion Dimension

Partial Regression Plot
Dependent Variable: Job Satisfaction
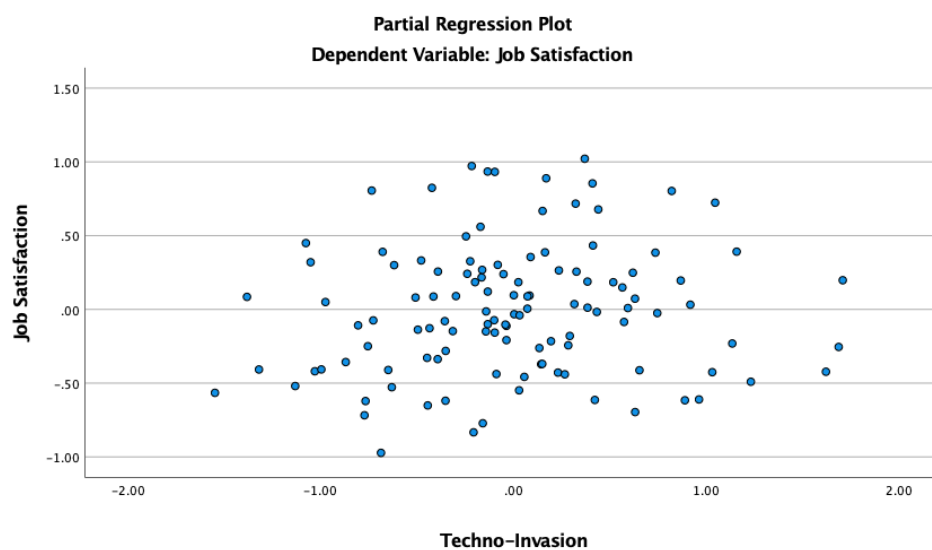
Figure 8

Partial Regression Plot – Job Satisfaction by Techno-Uncertainty Dimension

Partial Regression Plot
Dependent Variable: Job Satisfaction
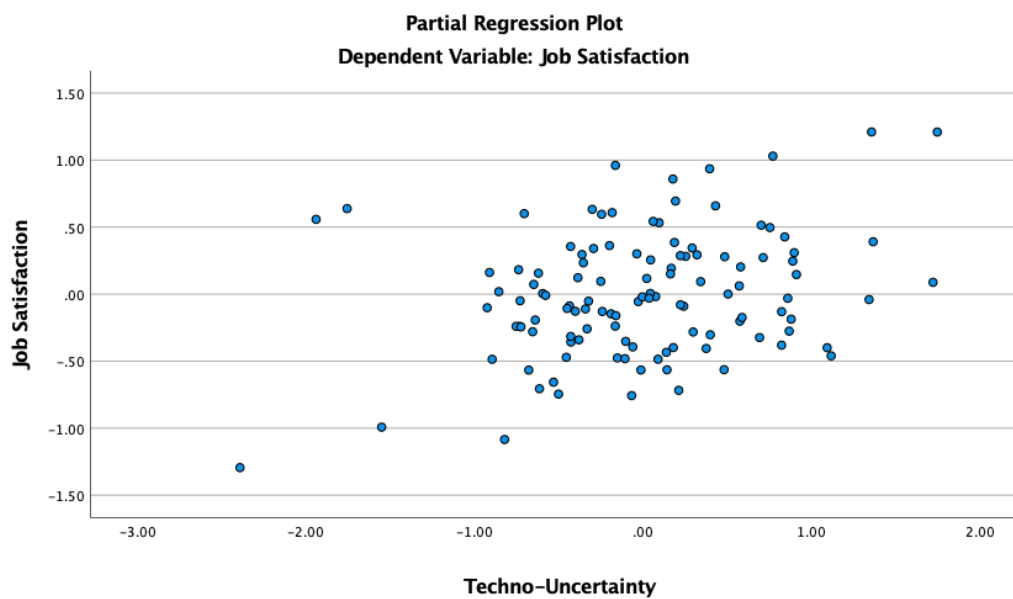
Figure 9

Partial Regression Plot – Job Satisfaction by Techno-Complexity Dimension
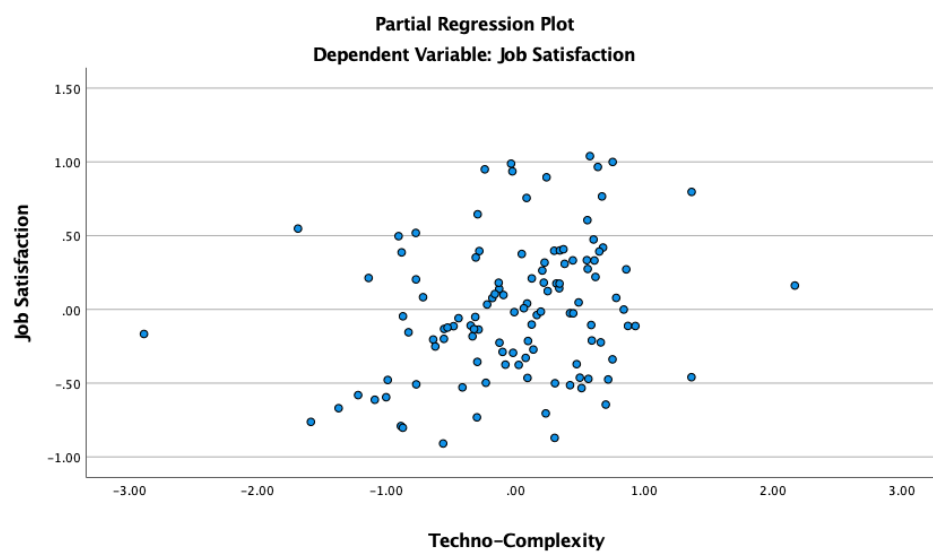
Figure 10

Partial Regression Plot – Job Satisfaction by Techno-Insecurity Dimension

Figure 11

Histogram

Histogram
Dependent Variable: Job Satisfaction
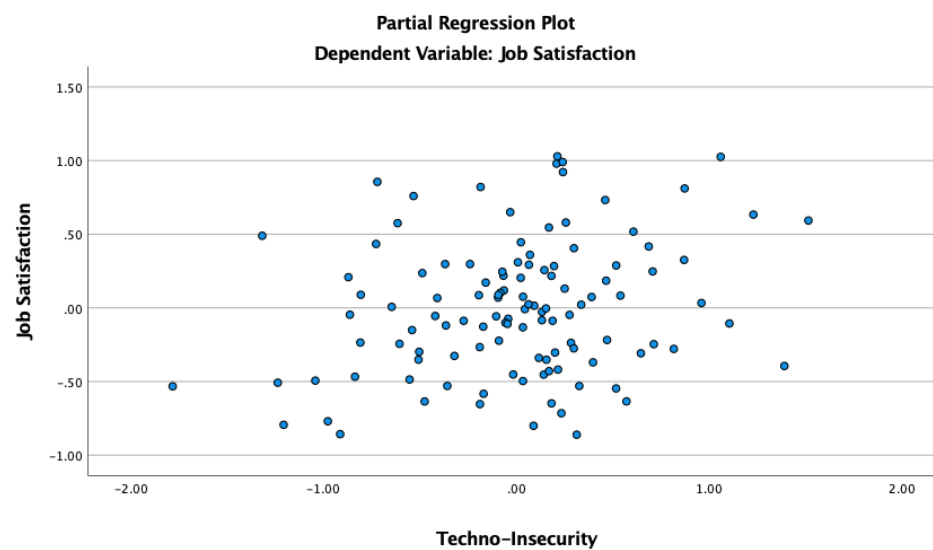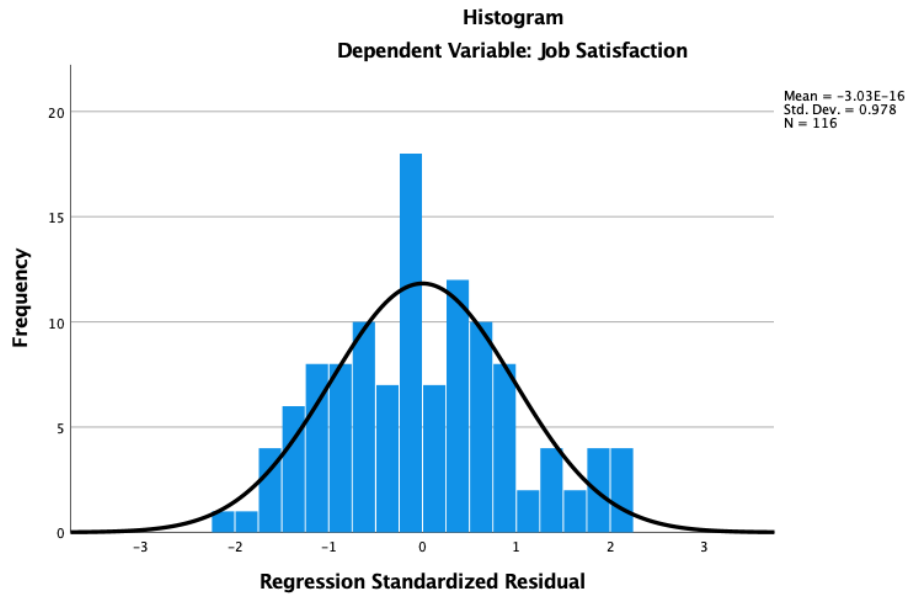
Figure 12

Normal P-P Plot

The sixth assumption was whether the data did not show multicollinearity. Laerd Statistics (2015) stated that VIF values above 10 indicate potential multicollinearity concerns. All VIF values were less than ten, as shown in **Table 13**. The data output met the MLR assumption of no multicollinearity within the data.

The seventh assumption was that the data had any unusual points (i.e., significant outliers, leverage, or influential points). The initial data analysis included one outlier that was removed. This circumstance changed the total number of participants from 118 to 116. No different SPSS output violated the outlier assumption based on the ±3 standard deviation threshold for the MLR analysis. The dataset's studentized deleted residuals (SDR) were not greater than ±3 standard deviations. The assessment of leverage points in SPSS considers values less than 0.2 as low leverage points and values greater than 0.5 as

high leverage points that can be problematic within the data set (Laerd Statistics, 2015).

All values were less than 0.5, which means the data had no leverage points. The Cook's

distance values indicated any influential points in the data. SPSS stored the values for

each case in the data. All values were less than 1, which means the data had no influential

points. The data output met the MLR assumption of no unusual points, as shown in Table

10.

Table 10

Leverage Values and Influential Points

	Min	Max	M	SD	N
Cook's Distance	.000	.181	.013	.025	116
Centered Leverage Value	.002	.198	.043	.035	116

Note. $N = 116$; M = Mean; SD = Standard Deviation

      The eighth assumption was whether the data had a normal distribution. The

assumption of normality of the residuals was assessed with a histogram with a

superimposed normal curve in Figure **11** and a P-P plot in **Figure 12** which were part of

the MLR analysis. The data output met the MLR assumption of normality.

      In Table 11, the multiple correlation coefficient, 0.766, indicates a moderate to

strong association level. The coefficient of determination (R^2) for the overall model was

0.586. The R^2 statistic indicated that technostress explained 58.6% of the variability of

employee job satisfaction in the data sample. According to the analysis of variance

(ANOVA) results, the independent variable had a significant effect on the dependent

variable, as listed in Table 12.

Table 11

Model Summary for Technostress Dimensions

Model	R	R^2	SE	Durbin-Watson
1	.766[a]	.586	.44878	2.357

Note. R^2 = coefficient of determination; SE = Standard Error of the Estimate; p = probability; [a] Dependent Variable: Job Satisfaction

Table 12

One-Way ANOVA for Technostress Dimensions

	Model	SS	df	MS	F	*p*
1	Regression	31.414	5	6.283	31.195	<.001[b]
	Residual	22.154	110	.201		
	Total	53.568	115			

Note. SS = sum of squares; df = degree of freedom; MS = Mean Square; F = F distribution, *p* = probability; ANOVA = analysis of variance
Dependent Variable: Job Satisfaction
Independent Variable: Technostress-Overload, Techno-Invasion, Techno-Uncertainty, Techno-Complexity, Techno-Insecurity
[*]p < .05, [**]p < .01, [***]p < .001.

In **Table 13**, the multiple regression analysis was conducted for research question 1 for the relationship between the overall technostress and employee job satisfaction variables. The multiple regression model was statistically significant in determining job satisfaction, $F_{(5, 115)} = 31.195$, $p < .001$. The regression coefficients and standard errors are in **Table 13**. The regression equation is expressed in the following form:

$$predicted\ (employee\ job\ satisfaction) = b_0 + (b_1 \times techno - overload) +$$

$$(b_2 \times techno - invasion) + (b_3 \times techno - uncertainty)\ + (b_4 \times techno -$$

$$uncertainty)\ + (b_5 \times techno - insecurity)\ = 1.817 + (.023 \times techno -$$

$$overload) + (.075 \times techno - invasion) + (.199 \times techno - uncertainty)\ +$$

$$(.163 \times techno - uncertainty)\ + (.191 \times techno - insecurity). \text{ The slope}$$

coefficient is positive, so an increase in technostress would increase employee job satisfaction.

Regression coefficients and standard errors are in **Table 13**. The findings indicated that the relationship between techno-overload and employee job satisfaction were not statistically significant ($\beta = .034$, t $(115) = .299$, p $< .765$). The results failed to reject the null hypotheses (H_01_1 and H_01_2) for research question 1. The results indicated that techno-overload caused by rapidly changing technology had no significant effect on job satisfaction for ICT employees. Based on the sample, the ICT employees did not incur situations where rapidly changing technology forced them to work faster or longer.

The findings indicated that the relationship between techno-invasion and employee job satisfaction was not statistically significant ($\beta = .119$, t $(115) = 1.150$, $p <$ .253). The results failed to reject the null hypotheses (H_01_1 and H_01_2) for research question 1. The results indicated that techno-invasion due to rapidly changing technology had no significant effect on the job satisfaction of ICT employees. Based on the sample, the ICT employees did not incur situations where rapidly changing technology caused a blurred line or invasion between their personal and work lives.

The findings indicated that techno-uncertainty and employee job satisfaction were significantly positive ($\beta = .244$, t $(115) = 3.310$, $p = .001$). The results were positively significant at the $p < .01$ level. The results rejected the null hypotheses (H_01_1 and H_01_2) for research question 1. The results indicated that techno-uncertainty due to rapidly changing technology significantly affected the job satisfaction of ICT employees. Based on the sample, ICT employees felt uncertain about rapidly changing technology.

The findings indicated that techno-insecurity and employee job satisfaction were significantly positive ($\beta = .295$, t (115) = 2.574, $p = .011$). The results were positively significant at the $p < .05$ level. The results failed to reject the null hypotheses (H_01_1 and H_01_2) for research question 1. The results indicated that techno-insecurity due to rapidly changing technology significantly affected the job satisfaction of ICT employees. Based on the sample, ICT employees felt threatened by either technology or other employees more competent with rapidly changing technology would replace them.

The findings indicated that the relationship between techno-complexity and employee job satisfaction was significantly positive ($\beta = .273$, t (115) = 2.709, p = .008). The results were positively significant at the $p < .01$ level. The results indicated that techno-complexity due to rapidly changing technology significantly affected the job satisfaction of ICT employees. Based on the sample, ICT employees felt they had inadequate skill sets to complete their ICT-related work tasks due to the complexity of rapidly changing technology.

Table 13

Regression Results for Job Satisfaction by Technostress Dimensions

	Variable	B	SE	β	SE	t	p	Tolerance	VIF
	(Constant)	1.817	.204			8.915	<.001		
	Techno-Overload [b]	.023	.076	.034	.114	.299	.765 [ns]	.288	3.467
1	Techno-Invasion [b]	.075	.065	.119	.103	1.150	.253 [ns]	.352	2.845
	Techno-Uncertainty [b]	.199	.060	.244	.074	3.310	.001 [**]	.694	1.440
	Techno-Complexity [b]	.163	.060	.273	.101	2.709	.008 [**]	.371	2.697
	Techno-Insecurity [b]	.191	.074	.295	.114	2.574	.011 [*]	.287	3.486

Note. Model = "Enter" method in SPSS Statistics; B = unstandardized regression coefficient; SE = standard error of the coefficient; β = standardized coefficient; p = probability; R^2 = coefficient of determination; ns = not statistically significant; *VIF* = Variance Inflation Factor
[a] Dependent Variable: Job Satisfaction
[b] Independent Variables: Technostress-Overload, Techno-Invasion, Techno-Uncertainty, Techno-Complexity, Techno-Insecurity
[*]$p < .05$, [**]$p < .01$, [***]$p < .001$.

Table 14

Results Summary of Hypothesis Testing for Job Satisfaction by Technostress

Hypotheses		Results
$H_0 1_1$	Technostress has no significant and negative impact on ICT employee job satisfaction.	Failed to reject the null
$H_1 1_1$	Technostress has a significant and negative impact on ICT employee job satisfaction.	Failed to reject the null.
$H_0 1_2$	Technostress has no significant and positive impact on ICT employee job satisfaction.	Failed to reject the null.
$H_1 1_2$	Technostress has a significant and positive impact on ICT employee job satisfaction	SS (techno-uncertainty) SS (techno-complexity) SS (techno-insecurity)

Note. ICT = Information and Communication Technology, NSS = Not statistically significant; SS = statistically significant

Research Question 2 and Hypotheses

RQ2: To what extent do leadership styles determine employee job satisfaction among ICT employees?

$H_0 2_1$: Transformational leadership has no significant positive impact on ICT employee job satisfaction.

$H_1 2_1$: Transformational leadership has a significant positive impact on ICT employee job satisfaction.

$H_0 2_2$: Transformational leadership has no significant negative impact on ICT employee job satisfaction.

H_12_2: Transformational leadership has significant negative impacts on ICT employee job satisfaction.

H_02_3: Transactional leadership has no significant negative impacts on ICT employee job satisfaction.

H_12_3: Transactional leadership has a significant negative impact on ICT employee job satisfaction.

H_02_4: Transactional leadership has no significant positive impact on ICT employee job satisfaction.

H_12_4: Transactional leadership has a significant positive impact on ICT employee job satisfaction.

H_02_5: Laissez-faire leadership has no significant negative impact on ICT employee job satisfaction.

H_12_5: Laissez-faire leadership has a significant negative impact on ICT employee job satisfaction.

H_02_6: Laissez-faire leadership has no significant positive impact on ICT employee job satisfaction.

H_12_6: Laissez-faire leadership has a significant positive impact on ICT employee job satisfaction.

Hypothesis Testing for Research Question 2

As with the first research question, the first step in a multiple linear regression (MLR) analysis is assessing the eligibility of eight assumptions. Within the eight assumptions, the two primary assumptions have (a) one continuous dependent variable

and (b) at two least continuous two independent variables. The remaining assumptions include (a) independence of observations, (b) linearity, (c) homoscedasticity, (d) no multicollinearity, (e) no unusual points (i.e., outliers, leverage, or influential points), and (f) normality (Laerd Statistics, 2015).

The first assumption was whether the study included a continuous dependent variable. The dependent variable, employee job satisfaction, included a scale level of measurement measured by the JSS instrument. The second assumption was whether the study included at least two independent variables. The three continuous independent variables are transformational, transactional, and passive avoidance leadership styles. The existence of the continuous dependent and independent variables does not violate the first and second assumptions of an MLR analysis.

The third assumption was whether the study's data has independence of observations (i.e., independence of residuals). The Durbin-Watson statistic can assess the independence of the residuals (Laerd Statistics, 2015). The Durbin-Watson statistic ranges from 0 to 4, and a value close to 2 indicates no correlation between residuals (Laerd Statistics, 2015). Residuals were independent, as assessed by a Durbin-Watson statistic of 1.924. The assumption of independence of errors was met.

The fourth assumption was whether a linear relationship existed between (a) the dependent variable and the independent variables individually and (b) the dependent variable and the independent variables collectively. According to Laerd Statistics (2015), a scatterplot of the studentized residuals against the unstandardized (i.e., predicted) values can collectively assess linearity between the dependent and independent variables.

The scatter plot in Figure 13 collectively meets this criterion for the linearity assumption between the dependent and independent variables. The partial regression plots for job satisfaction by transformational, transactional, and passive avoidant leadership are shown in Figure **16** through Figure **18**. The scatter plots in Figure **16** through Figure **18** meet the criterion for the linearity assumption between the dependent and independent variables individually.

The fifth assumption was whether the data showed homoscedasticity of residuals (i.e., equal error variances). According to Laerd Statistics (2015), visual inspection of the randomly scattered residuals can ensure that the assumption of homoscedasticity of residuals is met. The data had homoscedasticity, as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values in Figure 13. The assumption of homoscedasticity of an MLR analysis was met.

Figure 13

Scatter Plot of Studentized Residual by Unstandardized Predicted Value (Leadership Styles and Job Satisfaction
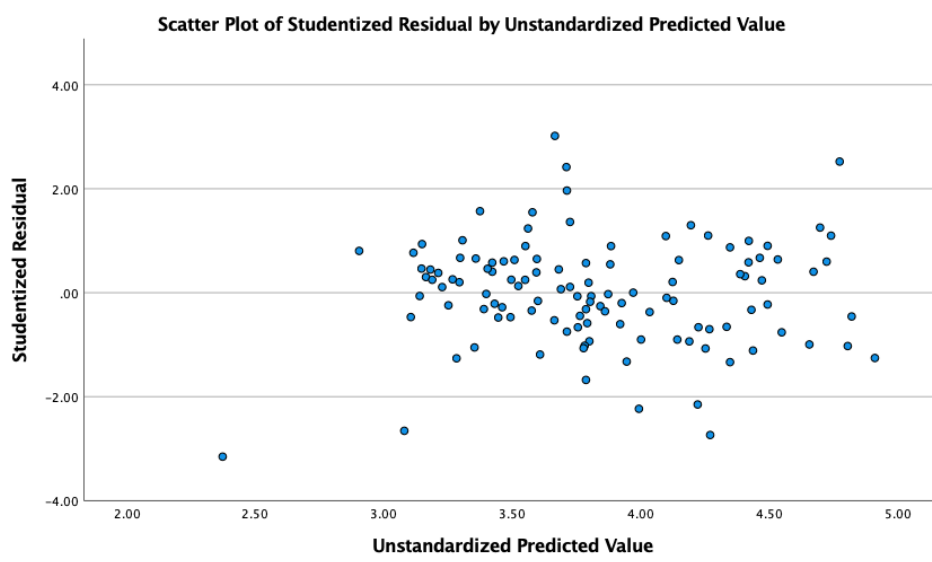
Figure 14

Histogram (Leadership Styles and Job Satisfaction)
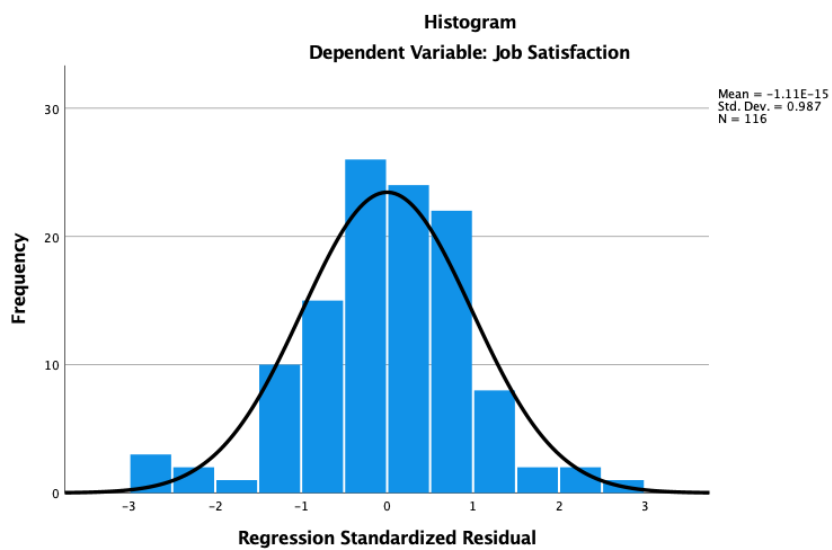
Figure 15

Normal P-P Plot
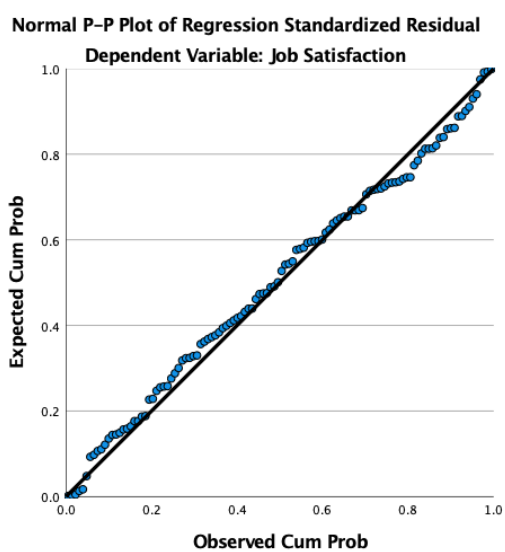
Figure 16

Scatter Plot of Job Satisfaction by Transformational Leadership
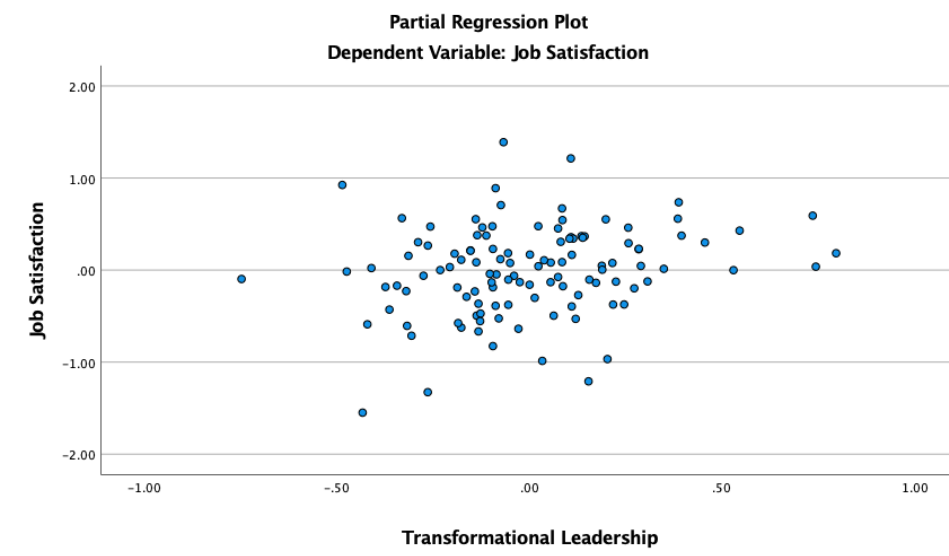
Figure 17

Partial Regression Plot of Job Satisfaction by Transactional Leadership
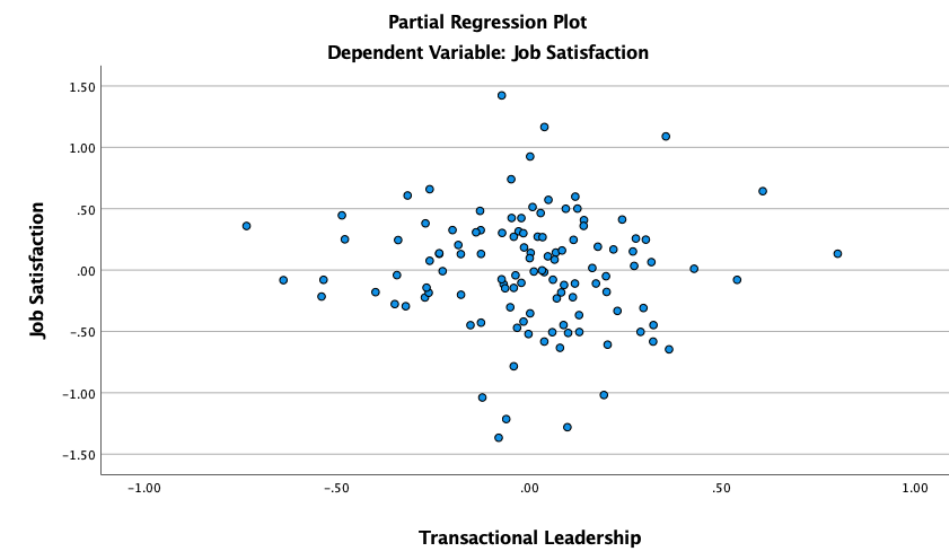
Figure 18

Partial Regression Plot of Job Satisfaction by Passive Avoidant Leadership
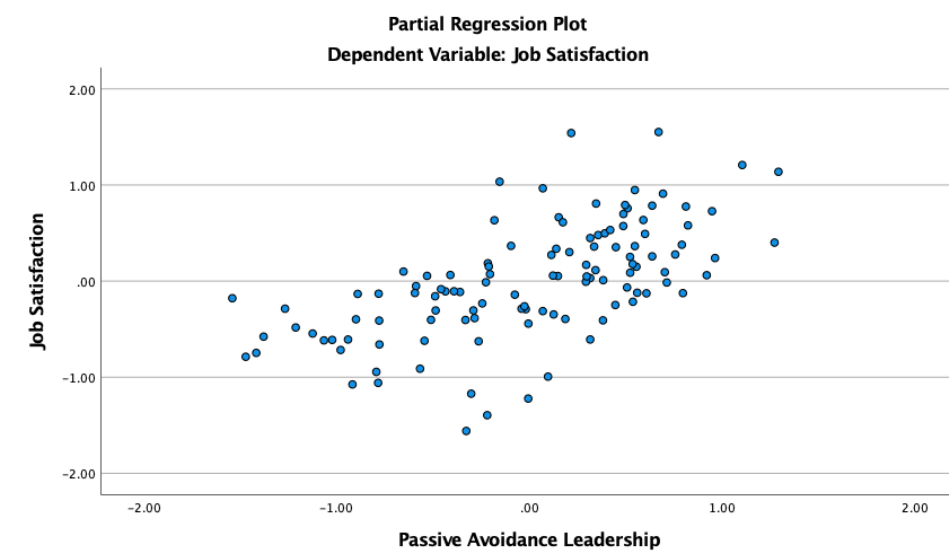
Partial Regression Plot
Dependent Variable: Job Satisfaction

The sixth assumption was whether the data did not show multicollinearity. Laerd

Statistics (2015) stated that VIF values above 10 indicate potential multicollinearity

concerns. All VIF values were less than 10. The data output met the MLR assumption of

no multicollinearity within the data.

In Table 15, the seventh assumption was that the data had any unusual points (i.e.,

significant outliers, leverage, or influential points). The initial data analysis included one

outlier that was removed. This circumstance changed the total number of participants

from 118 to 116. No different SPSS output violated the outlier assumption based on the

±3 standard deviation threshold for the MLR analysis. The dataset's studentized deleted

residuals (SDR) were not greater than ±3 standard deviations. The assessment of leverage

points in SPSS considers values less than 0.2 as low leverage points and values greater

than 0.5 as high leverage points that can be problematic within the data set (Laerd

Statistics, 2015). All values were less than 0.5, which means the data had no leverage

points. The Cook's distance values were used to assess any influential points in the data.

SPSS stored the values for each case in the data. All values were less than 1, which

means the data had no influential points. The data output met the MLR assumption of no

unusual points, as shown in Table 15.

Table 15

Leverage Values and Influential Points

	Min	Max	M	SD	N
Cook's Distance	.000	.453	.012	.044	116
Centered Leverage Value	.002	.145	.026	.023	116

Note. $N = 116$; M = Mean; *SD* = Standard Deviation

The eighth assumption was whether the data had a normal distribution. The

assumption of normality of the residuals was assessed with a histogram with a

superimposed normal curve in Figure **14** and a P-P plot in Figure **15**, which were part of

the MLR analysis. The assumption of normality was met.

In Table 16, the multiple correlation coefficient, 0.729, indicates a moderate to

strong association level. The coefficient of determination (R^2) for the overall model was

0.531. The R^2 statistic indicated that technostress explained 53.1% of the variability of

employee job satisfaction in the data sample. According to the ANOVA results, the

independent variables significantly affect the dependent variable, as listed in Table 17.

Table 16

Model Summary for Leadership Styles

Model	R	R^2	SE	Durbin-Watson
1	.729[a]	.531	.47360	2.307

Note. R^2 = coefficient of determination; SE = Standard Error of the Estimate; *p* = probability; [a] Dependent Variable: Job Satisfaction, [b] Independent Variables: Transformational, Transactional, Passive Avoidant

Table 17

One-Way ANOVA for Job Satisfaction by Leadership Styles

	Model	SS	df	MS	F	Sig.
1	Regression	28.447	3	9.482	42.276	<.001[b]
	Residual	25.121	112	.224		
	Total	53.568	115			

Note. SS = sum of squares; df = degree of freedom; MS = Mean Square; F = F distribution, *p* = probability; ANOVA = analysis of variance
[a] Dependent Variable: Job Satisfaction, [b] Independent Variables: Transformational, Transactional, Passive Avoidant
[*]p < .05, [**]p < .01, [***]p < .001.

In Table 19, the multiple regression analysis was conducted for research question 2 for the relationship between the leadership styles (i.e., transformational, transactional, and passive avoidance). The multiple regression model was statistically significant in determining job satisfaction, F (3, 115) = 42.276, *p* < .001. The regression coefficients and standard errors are in Table 19. The regression equation is expressed in the following form: $predicted\ (employee\ job\ satisfaction) = b_0 + (b_1 \times$ $transformational\ leadership) + (b_2 \times transactional\ leadership) +$ $(b_3 \times passive\ avoidant\ leadership) = 2.373 + (.406 \times$ $transformational\ leadership) - (.091\ x\ transactional\ leadership) +$

($.569$ *x passive avoidance leadership*). The slope coefficient is positive for both transformational and passive avoidant leadership.

Regression coefficients and standards are in Table 19. The findings indicated that the relationship between transformational leadership and employee job satisfaction was significantly positive ($\beta = .300$, t $(115) = 2.386$, $p = .019$). The results rejected the null hypotheses, H_021 and H_022, for transformational leadership style. The circumstance implies that as ICT employees view their leadership as having a transformational leadership style, they have increased job satisfaction based on that aspect.

The findings indicated that the relationship between transactional leadership and employee job satisfaction was not statistically significant ($\beta = -.069$, t $(115) = -.501$, $p = .617$). The results did not reject the null hypotheses, H_023 and H_024, for research question 2. The results indicated that the transactional leadership style had no significant effect on the job satisfaction of ICT employees.

The findings indicated that the relationship between passive avoidance and employee job satisfaction was statistically significant ($\beta = .637$, t $(115) = 8.233$, $p < .001$). The results rejected the null hypotheses, H_025 and H_026, for research question 2. The results indicated that ICT employees view their leadership as having a passive avoidant leadership style and have increased job satisfaction based on that aspect.

Table 18

Regression Results for Job Satisfaction by Leadership Style Dimensions

	Variable	B	SE	β	t	p	Tolerance	VIF
1	(Constant)	2.373	.186		12.765	<.001		
	Transformational [b]	.406	.170	.300	2.386	.019**	.264	3.787
	Transactional [b]	-.091	.182	-.069	-.501	.617	.218	4.588
	Passive Avoidance [b]	.569	.069	.637	8.233	<.001***	.699	1.431

Note. Model = "Enter" method in SPSS Statistics; B = unstandardized regression coefficient; SE = standard error of the coefficient; β = standardized coefficient; p = probability; R^2 = coefficient of determination; ns = not statistically significant; VIF = Variance Inflation Factor
[a] Dependent Variable: Job Satisfaction
[b] Independent Variables: Transformational, Transactional, Passive Avoidant
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 19

Results Summary of Hypothesis Testing for Job Satisfaction by Leadership Styles

Hypotheses		Results
$H_0 2_1$	Transformational leadership has no significant and positive impact on ICT employee job satisfaction.	Rejected the null
$H_1 2_1$	Transformational leadership has a significant and positive impact on ICT employee job satisfaction.	Rejected the null; SS
$H_0 2_2$	Transformational leadership has no significant and negative impact on ICT employee job satisfaction.	Failed to reject the null
$H_1 2_2$	Transformational leadership has a significant and negative impact on ICT employee job satisfaction.	Failed to reject the null; NSS
$H_0 2_3$	Transactional leadership has no significant and negative impact on ICT employee job satisfaction.	Failed to reject the null
$H_1 2_3$	Transactional leadership has a significant and negative impact on ICT employee job satisfaction.	Failed to reject the null; NSS
$H_0 2_4$	Transactional leadership has no significant and positive impact on ICT employee job satisfaction.	Failed to reject the null
$H_1 2_4$	Transactional leadership has a significant and positive impact on ICT employee job satisfaction.	Failed to reject the null; NSS
$H_0 2_5$	Laissez-faire leadership has no	Failed to reject the null

	significant and negative impact on ICT employee job satisfaction.	
H_12_5	Laissez-faire leadership has a significant and negative impact on ICT employee job satisfaction.	Failed to reject the null
H_02_6	Laissez-faire leadership has no significant and positive impact on ICT employee job satisfaction.	Rejected the null
H_12_6	Laissez-faire leadership has a significant and positive impact on ICT employee job satisfaction.	Rejected the null; NSS

Note. ICT = Information and Communication Technology, NSS = Not statistically significant; SS = statistically significant

Research Question 3 and Hypotheses

RQ3:   As the correlation of leadership style increases, to what extent does the

relationship between technostress and ICT employee job satisfaction

increase or decrease?

H_03_1: As the correlation of transformational leadership increases, no effect will

occur on the negative relationship between technostress and ICT employee job

satisfaction.

H_13_1: As the correlation of transformational leadership increases, the negative

relationship between technostress and ICT employee job satisfaction will decrease.

H_03_2: As the correlation of transactional leadership increases, no effect will occur

on the negative relationship between technostress and ICT employee job satisfaction.

H_13_2: As the correlation of transactional leadership increases, the negative

relationship between technostress and ICT employee job satisfaction will decrease.

H_03_3: As the correlation of laissez-faire leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction will increase.

H_13_3: As the correlation of laissez-faire leadership increases, the negative relationship between technostress and ICT employee job satisfaction will increase.

Hypothesis Testing for Research Question 3

The hypotheses testing for research question 3 included a moderated MLR analysis to measure the moderating effect of leadership styles on the relationship between technostress and employee job satisfaction. The moderating analysis included moderating variables based on each technostress dimension (i.e., techno-overload, techno-invasion, techno-uncertainty, techno-complexity, and techno-insecurity) with each leadership style (i.e., transformational, transactional, and passive avoidance). The analysis included 15 moderated regression analyses. None of the moderated analyses produced statistically significant results. In all cases, the hypotheses results failed to reject the null hypotheses in research question 3, as stated in Table 11.

Table 20

Results Summary of Hypothesis Testing for Leadership Styles as a Moderator Between Technostress and Job Satisfaction

Hypotheses		Results
H_03_1	As the correlation of transformational leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.	Failed to reject the null; NSS
H_13_1	As the correlation of transformational leadership increases, the negative relationship between technostress and ICT employee job satisfaction will	Failed to reject the null; NSS

H_03_2	decrease. As the correlation of transactional leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.	Failed to reject the null; NSS
H_13_2	As the correlation of transactional leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.	Failed to reject the null; NSS
H_03_3	As the correlation of laissez-faire leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction will increase.	Failed to reject the null; NSS
H_13_3	As the correlation of laissez-faire leadership increases, the negative relationship between technostress and ICT employee job satisfaction will increase.	Failed to reject the null; NSS

Note. ICT = Information and Communication Technology, NSS = Not statistically significant; SS = statistically significant

Summary

Chapter 4 restated the purpose of this quantitative, nonexperimental, correlational study and the research questions, alternative and null hypotheses. The study stated the data collection methods, sample demographics, and representativeness. The study showed the hypotheses testing and findings.

The quantitative correlational study examined the role of leadership styles between technostress and employee job satisfaction. The research questions utilized multiple and moderated linear regression analysis as hypotheses testing. The relationship between technostress (i.e., techno-uncertainty, techno-complexity, and techno-insecurity) and employee job satisfaction revealed a statistically significant result. The relationships between leadership styles (i.e., transformational and passive avoidance leadership) were

statistically significant. However, the relationship between transactional leadership style and employee job satisfaction did not reveal a statistically significant result.

A multiple linear regression analysis between technostress and employee job satisfaction answered research question 1. The results from a multiple linear regression answered research question 2 between leadership styles (i.e., transformational, transactional, and passive avoidant leadership. The results were summarized at the end of each hypotheses test for each research question. Research question 3 did not provide any statistically significant results for moderators of leadership styles for the relationship between technostress and employee job satisfaction.

Chapter 5: Discussion, Conclusions, and Recommendations

This quantitative, nonexperimental correlational study examined the role of leadership styles between technostress and employee job satisfaction. I aimed to examine if the technostress of ICT employees determines job satisfaction based on the moderating impact of leadership styles within FRLT. The research study included an anonymous online questionnaire.

The specific research design of this quantitative study included a nonexperimental correlational approach with ratings of leadership style as a moderator of the relationship between technostress and job satisfaction. This data collection process included survey responses from ICT employees to sustain their employment in their associated workplace. Qualtrics randomly selected research participants based on inclusion and exclusion criteria that address the research questions. The target population included non-management employees who utilize ICT and identify as a subordinate to a leader in the United States. The target sample included non-management employees who utilize ICT and identify as subordinates in six states within the Southeastern United States (Mississippi, Louisiana, Arkansas, Alabama, Georgia, and Tennessee).

The study revealed a statistically significant relationship between technostress (i.e., techno-uncertainty, techno-complexity, and techno-insecurity) and employee job satisfaction. Also, the study revealed statistically significant results for the relationships between transformational leadership and passive avoidant leadership on employee job satisfaction. Transactional leadership did not have a statistically significant impact on job

satisfaction. Lastly, the study failed to reveal a statistically significant relationship as a moderator between technostress and employee job satisfaction.

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Interpretation of Findings

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Research Question 1 Discussion of Findings

Research question 1 showed significantly positive relationships for techno-uncertainty ($\beta = .244$, t $(115) = 3.310$, $p = .001$), techno-complexity ($\beta = .273$, t $(115) = 2.709$, $p = .008$), techno-insecurity ($\beta = .295$, t $(115) = 2.574$, $p = .011$) between employee job satisfaction as listed in Table 14. The results rejected the null hypotheses (H_01_1 and H_01_2) for research question 1. The results indicated that the relationships for both techno-overload ($\beta = .034$, t $(115) = .299$, $p < .765$) and techno-invasion ($\beta = .119$, t $(115) = 1.150$, $p < .253$) between employee job satisfaction were not statistically significant as listed in Table 14. The results failed to reject the null hypotheses (H_01_1 and H_01_2) for research question 1.

The current study's findings support previous peer-reviewed literature for a positive relationship between technostress and employee job satisfaction. In Chapter 2, the previously reviewed research literature indicated that positive relationships between technostress and employee job satisfaction are possible (Boonjing & Chanvarasuth, 2017). Tarafdar et al. (2019) explained that ICT employees with techno-eustress or positive stress would interpret technostress creators as challenges rather than hindrances. The results show that ICT employees have higher stress levels of job satisfaction even though they have increased stress due to rapidly changing technology. In addition, the results support the observation of the job satisfaction scores listed in Table 5. Most of the

participants in the sample were ambivalent or had mixed feelings about either job satisfaction or dissatisfaction with their ICT-related job tasks. The researcher used the Technostress Creators instrument to examine technostress and the JSS instrument to examine the job satisfaction (Spector, 1985b; Tarafdar et al., 2007).

Research Question 2 Discussion of Findings

The results concerning research question 2 indicated statistically positive relationships for transformational (β = .300, t (115) = 2.386, p = .019) and passive avoidant leadership styles (β = .637, t (115) = 8.233, $p < .001$) between employee job satisfaction as listed in Table 18. The findings rejected the null hypothesis (H_02_1 and H_02_6) for research question 2. The results did not show a statistical relationship between transactional leadership (β = -.069, t (115) = -.501, p = .617) and employee job satisfaction, as listed in Table 18. The findings failed to reject the null hypotheses (H_02_3 and H_02_4) for research question 2.

The current study's findings support previously peer-reviewed literature for a positive relationship between transformational leadership and employee job satisfaction. In Chapter 2, the previously peer-reviewed research literature showed mixed results between transformational leadership and employee job satisfaction. Previous research from Valldeneu et al. (2021) examined the relationship between leadership styles and organizational outcomes (i.e., effectiveness, job satisfaction, and extra effort). Valldeneu et al. (2021) reported that transformational leadership had a significantly positive relationship (β= 0.812, t = 16.869, p < 0.001; r = 0.885, $p < 0.01$) with organizational outcomes.

This study failed to reveal a statistically significant relationship between transactional leadership and employee job satisfaction. In Chapter 2, the previously peer-reviewed literature showed mixed results on the relationship between transactional leadership and employee job satisfaction. DeLay and Clark (2020) examined the relationship between managers' perceived transactional leadership style on employee job satisfaction. DeLay and Clark found that transactional leadership had a significantly positive correlation ($r = 0.81$, $p < 0.001$) with employee job satisfaction. DeLay and Clark used the Vannsimpco Leadership Survey and the Job Satisfaction Survey (JSS). Previous research from Barnett (2018) found that transactional was a negative and significant predictor of job satisfaction. The results of the current study did not support that transactional leadership factors (i.e., contingent rewards and active management-by-exception) determined job satisfaction for employees in the ICT in the United States.

The results concerning Research Question 2 confirmed that a significantly positive relationship existed between leadership styles (i.e., passive avoidant leadership) and employee job satisfaction. In Chapter 2, the peer-reviewed literature showed mixed results for the relationship between passive-avoidant leadership and employee job satisfaction. Previous research from Valldeneu et al. (2021) examined the relationship between leadership styles and organizational outcomes based on responses from 167 participants from Spain. Valldeneu et al. reported that passive-avoidant leadership had a significantly negative correlation ($\beta = -0.167$, $t = -4.168$, $p < 0.001$; $r = -0.484$, $p < 0.01$) with job satisfaction. However, Barnett (2018) examined the relationship between laissez-faire leadership and job satisfaction. Barnett found that laissez-faire leadership

was not statistically significant among online adjunct educators at a for-profit university in the United States. I used the MLQ-5X instrument to examine transformational, transactional, and passive-avoidant leadership styles and the JSS instrument to examine the job satisfaction (Bass & Avolio, 2004; Spector, 1985b). The results of the current study supported that passive avoidant leadership determined positive employee job satisfaction for ICT employees in the United States.

Research Question 3 Discussion of Findings

The results concerning research question 3 extended knowledge of leadership styles as a moderator between technostress and employee job satisfaction. In Chapter 2, previous literature from Boyer-Davis (2018) examined the relationship between leadership styles and technostress. Al-Ansari and Alshare's (2019) examined the relationship between technostress and employee job satisfaction. The current study's results did not support revealing leadership styles (i.e., transformational, transactional, and passive avoidance) as a statistically significant moderator between technostress and employee job satisfaction in the ICT field within the United States of America.

Findings' Interpretation Within Theoretical Framework

The theoretical framework included the FRLT construct. This study filled a gap in understanding technostress as an antecedent of leadership styles and job satisfaction as an outcome for employees using ICT technologies. Also, the study filled a gap in understanding leadership styles as a moderator between technostress and employee job satisfaction.

Limitations of the Study

The study included several external, internal, and construct validity limitations. The external validity limitations related to the sampling are based on inclusion and exclusion criteria. The internal validity was related to participants who did not meet the inclusion and exclusion criteria. The construct validity related to participants understanding the nature of items in the technostress, MLQ, and job satisfaction surveys. The three types of limitations could have impacted the generalizability and validity of the results.

External Validity Limitations

This study focused on employees who utilize ICT devices in the United States of America. The selected population sample came from within the Southeastern United States. This study's results may limit generalizability to all employees in the United States who utilize ICT devices and may limit the context of the results. ICT employees in various U.S. regions have differing opinions about how technostress determines job satisfaction. The number of ICT employees residing in the United States was unknown. Thus, the sample's representativeness from the Southeastern United States could not be determined. The inclusion and exclusion criteria limited the sample to those with at least 3 years of experience and were positioned in a non-leadership ICT role. The study was voluntary and anonymous for participants. Most of the participants were of White ethnicity. The sample produced 67% White participants and 33% non-White participants. This result may pose an ethnicity bias and decrease the findings' generalizability.

Internal Validity Limitations

Qualtrics extended invitations to participants that met inclusion criteria. The provided questionnaire was anonymous, and the researcher did not collect personal identifying or contact information. Based on the anonymous nature of the survey, the researcher could not confirm if the survey participants met the inclusion criteria.

Construct Validity Limitations

The combined survey questionnaire may be too long, and participants could have provided incomplete or inaccurate responses. The technostress creators instrument (i.e., predictor variable) included 23 items (Tarafdar et al., 2007). The leadership style instrument (i.e., moderating variable) will be the MLQ-5X rater form that includes 45 items (Bass & Avolio, 2004). The instrument for job satisfaction (outcome variable) included 36 items (Spector, 1985a). The questionnaire included Likert-style items. The self-reporting nature of the surveys could have affected the participants to provide unbiased answers. Online-based survey questionnaires included the potential for possible bias based on self-reported data.

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Recommendations

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Based on the strengths and limitations of the current study, recommendations for further research exist. Future researchers should investigate why technostress determines employee job satisfaction for employees within ICT. Future researchers could consider different sample populations in different regions of the United States. Future researchers could also analyze different populations besides employees in ICTs. Future researchers could use different research approaches to address research problems. The study used a

quantitative, nonexperimental research design to address the research problem based on the research gap. Participants could only choose appropriate responses from a Likert-type scale. Future studies could include other quantitative-based research designs (e.g., quasi-experimental or experimental) or qualitative methodologies to address a research gap. A qualitative research design would consider employees' experiences with ICT. The current study did not examine the moderating effects of demographic variables between technostress and job satisfaction. Future researchers could consider cross-sectional and longitudinal studies with various demographic variables such as age, ethnicity, and work experience durations.

The current study included over 100 items from three respective surveys. The number of questions could discourage prospective participants. Future researchers could consider using different research instruments for technostress, leadership styles, and job satisfaction with fewer items in the associated questionnaires. The technostress creator's instrument included 23 items. The current leadership styles instrument included 45 items. The current job satisfaction instrument, JSS, consists of 36 items. Other job satisfaction instruments could have fewer items that could take less time to complete the survey.

The current study addressed the perception of ICT employees. However, future studies could address perceptions of ICT leaders or supervisors within the same theoretical framework. Future studies could explore additional outcome variables such as burnout or work engagement with technostress and different leadership styles. The study could include a supervisor perspective from a technostress.

Implications

This study filled a gap in understanding technostress as an antecedent of leadership style and job satisfaction as an outcome for employees using ICT technologies. Since organizations incorporate advanced technology as a basis for positive social change, it is pertinent for technostress not to inhibit job satisfaction due to leadership style. The results of this study should aid in mitigating technostress among employees based on associated leadership styles. Leaders who utilize ICT devices to push drive leadership agendas could get supplemental training to increase cognizance of the potential moderating role of leadership styles between the relationship between technostress and job satisfaction. The results of this study aided in mitigating technostress among employees based on associated leadership styles. Leaders who utilize ICT devices to push drive leadership agendas could get supplemental training to increase cognizance of the potential moderating role of leadership styles between the relationship between technostress and job satisfaction.

Implications for Positive Social Change

This study contributed to positive social change by providing feedback to organizational leadership on utilizing ICT devices. This study filled a gap in the literature about leadership styles moderating the relationship between technostress and job satisfaction. The leadership styles include transformational, transactional, and laissez-faire within Bass and Avolio's (2004) FRLT theory (Valldeneu et al., 2021). This study expanded Boyer-Davis's (2018) theoretical framework, which included job satisfaction as an outcome variable from an employee perspective. The research literature increased

cognizance of employee outcome variables can help researchers understand if the FRLT model moderates the relationship between technostress and job satisfaction. The study showed the generalizability of the FRLT model in other populations.

Implications for Practice

This study's results may contribute to the relationships between leaders and subordinates using ICT devices. This research and its continuation may aid ICT organizations in the discernment of how ICT employees perceive different leadership styles affect job satisfaction. The results provided insight across different demographic variables such as age, ethnicity, years of experience, education, and annual income. This transition in practice may result in more ICT organizations developing more effective leaders who are more cognizant of employee technostress and job satisfaction. As organizations utilize more technology to communicate between leaders and followers, this study will inform how employees perceive the effects of rapidly changing technology and minimize pertinent work-related outcomes such as job satisfaction.

<div align="center">

Conclusions

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This quantitative, nonexperimental, correlational study examined the role of leadership styles between technostress and employee job satisfaction. This quantitative study aimed to examine if the technostress of ICT employees determines job satisfaction based on the moderating impact of leadership styles. The FRLT theory included the transformational, transactional, and passive avoidance leadership styles directed in this study (Bass & Avolio, 2004). In Chapter 2, I discussed FRLT and how it related to the

research problem, including technostress and employee job satisfaction. In Chapter 3, I discussed the details of this research methodology and the approach to data analysis.

Prior research showed how little or no literature exists regarding the influence of leadership style on the relationship between technostress and job satisfaction among employees (Bass & Avolio, 2004; Spector, 1985a; Tarafdar et al., 2007). The study expanded prior research on technostress, leadership styles, and employee job satisfaction. The study showed statistically significant results regarding the relationships between technostress and employee job satisfaction. Also, the study showed positive and statistically significant results for employee job satisfaction based on transformational and passive-avoidant leadership styles. This result implied that ICT employees who perceive the absence of leadership have increased job satisfaction.

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Appendix A: Inclusion and Demographic Survey Questions

Section 1: Inclusion Questions and Eligibility Criteria Page for Survey Participants

Indicate either "Yes" or "No" for the following four eligibility questions.

1	Are you a non-management employee who utilizes information and communication technologies (ICT) such as mobile devices or laptops to complete your daily job duties?	Yes	No
2	Are you a part-time or full-time employee for an information technology (IT) organization?	Yes	No
3	Do you live in one of the following states within the Southeastern U.S. (e.g., Mississippi, Louisiana, Arkansas, Alabama, Georgia, and Tennessee)?	Yes	No
4	Do you have at least three years of experience in your occupation?	Yes	No

Qualtrics® will only include data for participants who responded yes to the above questions.

Section 2: Informed Consent Page for Survey Participants
Introduction: You are invited to participate in a research study about how leadership styles affect the relationship between technostress (i.e., technology stress) and employee job satisfaction. The confidential survey study is conducted by a Walden University student working toward a doctoral degree. I will write a paper about the research findings. This form will help you decide whether to participate in this research study. Participation in this research is voluntary.

Volunteers must be:
Part-time or full-time employment status with at least three years of employment information technology (IT) professionals who are non-management employees who utilize information and communication technologies (ICT) at their jobs
residents within the six Southeastern United States: Mississippi, Louisiana, Arkansas, Alabama, Georgia, and Tennessee.

Procedures: The study will involve you completing the following steps:
- Complete a confidential online-based survey (25 minutes). This study includes items from three research instruments (i.e., Technostress Creators © instrument, Multifactor Leadership Questionnaire (MLQ-5x) © Instrument, and Job Satisfaction Survey (JSS) © Instrument).
- Read each statement carefully.
- Answer questions about your perceptions of technology stressors, your manager's leadership style, and your job satisfaction level.
- Select the answer that best describes your perception.
- Multiple responses are not possible.

Use of your responses: Your survey responses will only be used for academic research purposes. Once the doctoral student graduates, the study's results will be posted online in Scholarworks (a searchable publication of Walden University research).

Voluntary Nature of the Study: This study is voluntary. Research should only be done with those who freely volunteer. So, everyone involved will respect your decision to join or not. The identity of the participant and the name of the participant's organization are not required for this study.

Risks and Benefits of Being in the Study: This study could involve some risk of discomforts that can be encountered in daily life, such as sharing sensitive information. The study includes minimal psychological risks. The participants could later regret their responses about current opinions of their supervisor's leadership style. The questionnaire includes potential economic and professional risks to participants. Since the questionnaire asks participants to rate their agreement with leadership decisions in their workplace, there could be an impact on a participant's promotion opportunities if there were a confidentiality breach. The potential confidentiality breach could increase economic and professional risks to the participant in this circumstance. To minimize this risk, it is recommended that you complete this survey outside of your workplace. This study offers no direct benefits to individual volunteers. This study aims to benefit society by providing awareness of how technology stressors can affect employee job satisfaction based on the influence of different leadership styles.

Payment: You will not be paid for your participation by the researcher. The researcher is not legally responsible for any incentives Qualtrics offers in the participation request. Qualtrics is solely responsible for any incentives that may be offered for your participation.

Privacy: The researcher is required to protect your privacy. The researcher will not ask for your name at any time or link your responses to your contact info. The researcher will not use your personal information outside this project. Also, the researcher will not include your name or anything else that could identify you in the study reports. If the researcher were to share this dataset with another researcher in the future, the dataset would contain no identifiers, so this would not involve another round of obtaining informed consent. Data will be kept secure by including password protection, encryption, use of codes in place of names, storing names (when necessary) separately from the data, and discarding names (when possible). Data will be kept for at least five years, as the university requires. In place of a consent signature, completing the survey would indicate that you consent to your responses being analyzed in the study.

Contacts and Questions: You can ask the researcher questions by email at terrence.carter@waldenu.edu. If you want to talk privately about your rights as a participant or any negative parts of the study, you can call Walden University's Research Participant Advocate at 612-312-1210 or email IRB@mail.waldenu.edu. Walden

University's approval number for this study is 01-12-23-0137128, and it expires on January 11, 2024. You might wish to retain this consent form for your records. You may ask the researcher or Walden University for a copy using the contact info above.

Sample Items from Technostress Creators © Instrument
Here are some sample items from the Technostress Creators © Instrument:
1)   I am forced by this technology to work much faster.
2)   The person I am rating talks optimistically about the future.
3)   The person I am rating spends time teaching and coaching.
4)   The person I am rating avoids making decisions.
5)   I feel I am being paid a fair amount for the work I do.

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Sample Items from MLQ-5x © Instrument
Here are some sample items from the MLQ-5x:
The person I am rating…
•   Talks optimistically about the future.
•   Spends the time teaching and coaching.
•   Avoids making decisions.

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Sample Items from JSS © Instrument
Here are some sample items from the JSS instrument:
1)   I feel I am being paid a fair amount for the work I do.
2)   There is really too little chance for promotion on my job.
3)   My supervisor is quite competent in doing his/her job.
4)   I am not satisfied with the benefits I receive.
5)   When I do a good job, I receive the recognition for it that I should receive.

Job Satisfaction Survey (JSS) © 1994 Paul E. Spector 1994, All Rights Reserved. Published by Paul E. Spector, https://paulspector.com/assessment-files/jss/jss-english.doc, with the permission of the author

Obtaining Your Consent: If you feel you understand the study and wish to volunteer, please indicate your consent by clicking on the "Take Your Survey" link below. If you decline participation in this survey, please click the "Decline Survey" link.

Section 3: Demographical Questions

5	What is your gender?	(1) Male	(2) Female

6	What is your ethnicity?	(1)	(2)	(3)	(4)	(5)	(6)
		American Indian	Asian	Black or African American	Hispanic	White	Other
7	What is your age (e.g., years)?	(1)	(2)	(3)	(4)	(5)	(6)
		18 - 26	27 - 35	36 - 44	45 - 53	54 – 62	> 63
8	What is your highest level of education?	(1)	(2)	(3)	(4)	(5)	(6)
		No school	High School	Two-year college	Bachelor's degree	Master's degree	Other
9	What is your annual income?	(1)	(2)	(3)	(4)	(5)	(6)
		<$25,000	$25,000 - $49,999	$50,000 - $74,999	$75,000 - $99,999	$100,000 - $124,999	>$125,000

Appendix B: Permission to Use Technostress Instrument

Date: 25 October 2021, 7:11 PM
From: Monideepa Tarafdar (mtarafdar@isenberg.umass.edu)
To: Terrence Carter (terrence.carter@waldenu.edu)

Subject: Permission to Use Technostress Instrument

Hello Terrence,
Sure, please go ahead. The papers are in the public domain so please be sure to cite them.
Good luck!

Professor Monideepa Tarafdar
Charles J. Dockendorff Endowed Professor
Isenberg School of Management
University of Massachusetts Amherst

Date: 25 October 2021, 7:44 PM
From: Terrence Carter (terrence.carter@waldenu.edu)
To: Monideepa Tarafdar (mtarafdar@isenberg.umass.edu | m.tarafdar@lancaster.ac.uk)
Subject: Permission to Use Technostress Instrument

Hello Dr. Tarafdar:

My name is Terrence Carter, a doctoral student at Walden University. My proposed study investigates the moderating role of leadership style between technostress and employee job satisfaction. I am planning to use the Technostress instrument for my research. My committee advisor is Dr. William Shriner at Walden University (College of Management and Technology). I am seeking permission to use the Technostress Measurement Tool for the research that I will be conducting.

I want to use and print your surveys under the following conditions:

1. I will include the copyright statement on all copies of the instrument
2. I will send you a copy of my dissertation upon completion, which will include associated survey data

If these are acceptable terms and conditions, please indicate your acknowledgment via email. Thank you so much for being so considerate of this request, and I look forward to hearing from you. Have a great day!

Regards,

Terrence Carter
Email: terrence.carter@waldenu.edu

Appendix C: Technostress Creators Instrument

Please circle a number between 0 and 5 to indicate the extent of technostress with each item where 1=

disagree strongly and 5 = *agree strongly*.

Item no.	Survey items	Do not know	Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly
1	I am forced by this technology to work much faster.	0	1	2	3	4	5
2	I am forced by this technology to do more than I can handle.	0	1	2	3	4	5
3	I am forced by this technology to work very tight time schedules.	0	1	2	3	4	5
4	I am forced to change my work habits to adapt to new technologies.	0	1	2	3	4	5
5	I have a higher workload because of increased technology complexity.	0	1	2	3	4	5
8	I spend less time with my family due to this technology.	0	1	2	3	4	5
9	I have to be in touch with my work even during my vacation due to this technology.	0	1	2	3	4	5
10	I have to sacrifice my vacation and weekend time to keep current on new technologies.	0	1	2	3	4	5
11	I feel my personal life is being invaded by this technology.	0	1	2	3	4	5
12	I do not know enough about this technology to handle my job satisfactorily.	0	1	2	3	4	5
13	I need a long time to understand and use new technologies.	0	1	2	3	4	5
14	I do not find enough time to study and upgrade my technology skills.	0	1	2	3	4	5
15	I find new recruits to this organization know more about computer technology than I do.	0	1	2	3	4	5
16	I often find it too complex for me to understand and use new technologies.	0	1	2	3	4	5
17	I feel constant threat to my job security due to new technologies.	0	1	2	3	4	5
18	I have to constantly update my skills to avoid being replaced.	0	1	2	3	4	5
19	I am threatened by coworkers with newer technology skills.	0	1	2	3	4	5
20	I do not share my knowledge with my coworkers for fear of being replaced.	0	1	2	3	4	5
21	I feel there is less sharing of knowledge among coworkers for fear of being replaced.	0	1	2	3	4	5
22	There are always new developments in the technologies we use in our organization.	0	1	2	3	4	5
23	There are constant changes in computer software in our organization.	0	1	2	3	4	5
24	There are constant changes in computer hardware in our organization.	0	1	2	3	4	5
25	There are frequent upgrades in computer network in our organization.	0	1	2	3	4	5

From Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301–328. https://doi.org/10.2753/MIS0742-1222240109. Copyright 2010 by M. Tarafdar, Q. Tu, B.S. Ragu-Nathan, & T. S. Nathan. Reprinted with permission.

Appendix D: Permission to Use Multifactor Leadership Questionnaire (MLQ-5X)

Multifactor Leadership Questionnaire™

Instrument (Leader and Rater Form)

and Scoring Guide
(Form 5X-Short)

by Bruce Avolio and Bernard Bass

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Due to copyright laws, this dissertation cannot include the entire MLQ instrument. However, there are three sample items from the Leader Form (5x-Short) and Rater Form (5x-Short).

Appendix E: Multifactor Leadership Questionnaire (MLQ)-5X Form

For use by Terrence Carter only. Received from Mind Garden, Inc. on October 25, 2021

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To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

Multifactor Leadership Questionnaire

The three sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below. Sample Items:

As a leader ....

    I talk optimistically about the future.
    I spend time teaching and coaching.
    I avoid making decisions.

The person I am rating....

    Talks optimistically about the future.
    Spends time teaching and coaching.
    Avoids making decisions

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

Appendix F: Permission to Use JSS Instrument

Date: Wednesday, October 27, 2021, 3:28 PM
From: Paul Spector (pspector@usf.edu | paul@paulspector.com)
To: Terrence Carter (terrence.carter@waldenu.edu)

Subject: Permission to Use JSS Instrument

Dear Terrence:

You have my permission to use the original JSS in your research. You can find copies of the scale in the original English and several other languages, as well as details about the scale's development and norms, in the Paul's No Cost Assessments section of my website: https://paulspector.com. I allow free use for noncommercial research and teaching purposes in return for sharing of results. This includes student theses and dissertations, as well as other student research projects. Copies of the scale can be reproduced in a thesis or dissertation as long as the copyright notice is included, "Copyright Paul E. Spector 1994, All rights reserved." Results can be shared by providing an e-copy of a published or unpublished research report (e.g., a dissertation). You also have permission to translate the JSS into another language under the same conditions in addition to sharing a copy of the translation with me. Be sure to include the copyright statement, as well as credit the person who did the translation with the year.

The JSS-2 is an improved commercial version for which there is a fee as explained here: https://paulspector.com/assessments/job-satisfaction-survey-2/.

For additional assessment resources including an archive of measures developed by others, check out the assessment section of my website for organizational measures https://paulspector.com/assessments/ and my companion site for general and mental health measures: https://www.stevenericspector.com/mental-health-assessment-archive/

Thank you for your interest in the JSS, and good luck with your research.

Best,

Paul Spector, PhD
Adjunct Professor, School of Information Systems and Management
Muma College of Business
Distinguished Professor Emeritus, Department of Psychology
University of South Florida
Tampa, FL 33620
Pspector@usf.edu
Website: https://paulspector.com/

Date: Wednesday, October 27, 2021, 3:34 PM
From: Terrence Carter (terrence.carter@waldenu.edu)
To: Paul Spector (pspector@usf.edu | paul@paulspector.com)

Subject: Permission to Use JSS Instrument

Hello Dr. Spector:

My name is Terrence Carter, a doctoral student at Walden University. My proposed study investigates the moderating role of leadership style between technostress and employee job satisfaction. I am planning to use the Job Satisfaction Survey (JSS) for my research. My committee advisor is Dr. William Shriner at Walden University (College of Management and Technology). I am requesting permission to use the Job Satisfaction Survey (JSS) for noncommercial educational research purposes.

I want to use and print your surveys under the following conditions:

1. I will include the copyright statement on all copies of the instrument
2. I will send you a copy of my dissertation upon completion, which will include associated survey data

If these are acceptable terms and conditions, please indicate your acknowledgment via email. Thank you so much for being so considerate of this request, and I look forward to hearing from you. Have a great day!
Regards,

Terrence Carter
Email: terrence.carter@waldenu.edu

Appendix G: Job Satisfaction Survey (JSS)

	JOB SATISFACTION SURVEY Paul E. Spector Department of Psychology University of South Florida Copyright Paul E. Spector 1994, All rights reserved.						
	PLEASE CIRCLE THE ONE NUMBER FOR EACHQUESTION THAT COMES CLOSEST TO REFLECTING YOUR OPINION ABOUT IT.	Disagree very much	Disagree moderately	Disagree slightly	Agree slightly	Agree moderately	Agree very much
1	I feel I am being paid a fair amount for the work I do.	1	2	3	4	5	6
2	There is really too little chance for promotion on my job.	1	2	3	4	5	6
3	My supervisor is quite competent in doing his/her job.	1	2	3	4	5	6
4	I am not satisfied with the benefits I receive.	1	2	3	4	5	6
5	When I do a good job, I receive the recognition for it that I should receive.	1	2	3	4	5	6
6	Many of our rules and procedures make doing a good job difficult.	1	2	3	4	5	6
7	I like the people I work with.	1	2	3	4	5	6
8	I sometimes feel my job is meaningless.	1	2	3	4	5	6
9	Communications seem good within this organization.	1	2	3	4	5	6
10	Raises are too few and far between.	1	2	3	4	5	6
11	Those who do well on the job stand a fair chance of being promoted.	1	2	3	4	5	6
12	My supervisor is unfair to me.	1	2	3	4	5	6
13	The benefits we receive are as good as most other organizations offer.	1	2	3	4	5	6
14	I do not feel that the work I do is appreciated.	1	2	3	4	5	6
15	My efforts to do a good job are seldom blocked by red tape.	1	2	3	4	5	6
16	I find I have to work harder at my job because of the incompetence of people I work with.	1	2	3	4	5	6
17	I like doing the things I do at work.	1	2	3	4	5	6
18	The goals of this organization are not clear to me.	1	2	3	4	5	6
19	I feel unappreciated by the organization when I think about what they pay me.	1	2	3	4	5	6
20	People get ahead as fast here as they do in other places.	1	2	3	4	5	6
21	My supervisor shows too little interest in the feelings of subordinates.	1	2	3	4	5	6
22	The benefit package we have is equitable.	1	2	3	4	5	6
23	There are few rewards for those who work here.	1	2	3	4	5	6
24	I have too much to do at work.	1	2	3	4	5	6
25	I enjoy my coworkers.	1	2	3	4	5	6
26	I often feel that I do not know what is going on with the organization.	1	2	3	4	5	6
27	I feel a sense of pride in doing my job.	1	2	3	4	5	6
28	I feel satisfied with my chances for salary increases.	1	2	3	4	5	6
29	There are benefits we do not have which we should have.	1	2	3	4	5	6
30	I like my supervisor.	1	2	3	4	5	6
31	I have too much paperwork.	1	2	3	4	5	6
32	I don't feel my efforts are rewarded the way they should be.	1	2	3	4	5	6
33	I am satisfied with my chances for promotion.	1	2	3	4	5	6
34	There is too much bickering and fighting at work.	1	2	3	4	5	6
35	My job is enjoyable.	1	2	3	4	5	6
36	Work assignments are not fully explained.	1	2	3	4	5	6

Appendix H: Invitation Email Sample from Qualtrics

A New Survey is Available

Hi Katy,

Someone wants to know what you think...

| | 145 | 25 min |
| | Award Value | Time to Complete |

This survey won't be available for long. Act now if you're interested.

Take Your Survey

Can't open the link? You can copy the link below into your browser

After successfully completing this survey, it may take up to 5 business days to receive in your account

If you cannot participate in this survey we would appreciate it if you could decline participation in this survey by clicking on the following link*: Decline survey

Appendix I: Linkage Between RQs, Hypotheses, and Factors in Research Instruments

Comprehensive table establishing the linkage among the research questions, hypotheses, and factors/questions in each instrument. The content of this table is briefly described on pages 93-94, but the table shows more apparent relationships. These relationships are the basis of the study's internal validity.

Table 21

Results Summary of Hypothesis Testing for Job Satisfaction by Leadership Styles

RQs	H		Independent (X)	Dependent (Y)	Survey Items
1	$H_0 1_1$	Technostress has no significant negative impact on ICT employee job satisfaction.	TSOVR TSINV TSUNC TSCOM TSINV	JS	TS (10-32) JS (78-113)
1	$H_1 1_1$	Technostress has a significant and negative impact on ICT employee job satisfaction.	TSOVR TSINV TSUNC TSCOM TSINV	JS	TS (10-32) JS (78-113)
1	$H_0 1_2$	Technostress has no significant and positive impact on ICT employee job satisfaction.	TSOVR TSINV TSUNC TSCOM TSINV	JS	TS (10-32) JS (78-113)
1	$H_1 1_2$	Technostress has a significant and positive impact on ICT employee job satisfaction.	TSOVR TSINV TSUNC TSCOM TSINV	JS	TS (10-32) JS (78-113)
2	$H_0 2_1$	Transformational leadership has no significant and positive impact on ICT employee job satisfaction	TRM	JS	LS (33-77) JS (78-113)
2	$H_1 2_1$	Transformational leadership has a significant and positive impact on ICT employee job satisfaction.	TRM	JS	LS (33-77) JS (78-113)
2	$H_0 2_2$	Transformational leadership has no significant and negative impact on ICT employee job satisfaction.	TRM	JS	LS (33-77) JS (78-113)

2	H_12_2	Transformational leadership has a significant and negative impact on ICT employee job satisfaction.	TRM	JS	LS (33-77) JS (78-113)
2	H_02_3	Transactional leadership has no significant and negative impact on ICT employee job satisfaction.	TRN	JS	LS (33-77) JS (78-113)
2	H_12_3	Transactional leadership has a significant and negative impact on ICT employee job satisfaction.	TRN	JS	LS (33-77) JS (78-113)
2	H_02_4	Transactional leadership has no significant and positive impact on ICT employee job satisfaction.	TRN	JS	LS (33-77) JS (78-113)
2	H_12_4	Transactional leadership has a significant and positive impact on ICT employee job satisfaction.	TRN	JS	LS (33-77) JS (78-113)
2	H_02_5	Laissez-faire leadership has no significant and negative impact on ICT employee job satisfaction.	PA	JS	LS (33-77) JS (78-113)
2	H_12_5	Laissez-faire leadership has a significant and negative impact on ICT employee job satisfaction.	PA	JS	LS (33-77) JS (78-113)
2	H_02_6	Laissez-faire leadership has no significant and positive impact on ICT employee job satisfaction.	PA	JS	LS (33-77) JS (78-113)

2	H_12_6	Laissez-faire leadership has a significant and positive impact on ICT employee job satisfaction.	PA	JS	LS (33-77) JS (78-113)
3	H_13_1	As the correlation of transformational leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.	TRM TOVR x TRM TINV x TRM TUNC x TRM TCOM x TRM TINV x TRM	JS	LS (33-77) JS (78-113)
3	H_03_1	As the correlation of transformational leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.	TRM TOVR x TRM TINV x TRM TUNC x TRM TCOM x TRM TINV x TRM	JS	TS (10-32) LS (33-77) JS (78-113)
3	H_03_2	As the correlation of transformational leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction.	TRN TOVR x TRN TINV x TRN TUNC x TRN TCOM x TRN TINV x TRN	JS	TS (10-32) LS (33-77) JS (78-113)
3	H_13_2	As the correlation of transactional leadership increases, the negative relationship between technostress and ICT employee job satisfaction will decrease.	TRN TOVR x TRN TINV x TRN TUNC x TRN TCOM x TRN TINV x TRN	JS	TS (10-32) LS (33-77) JS (78-113)
3	H_03_3	As the correlation of laissez-faire leadership increases, no effect will occur on the negative relationship between technostress and ICT employee job satisfaction will increase.	PA TOVR x PA TINV x PA TUNC x PA TCOM x PA TINV x PA	JS	TS (10-32) LS (33-77) JS (78-113)

| 3 | H_13_3 | As the correlation of laissez-faire leadership increases, the negative relationship between technostress and ICT employee job satisfaction will increase. | PA
TOVR x PA
TINV x PA
TUNC x PA
TCOM x PA
TINV x PA | JS | TS (10-32)
LS (33-77)
JS (78-113) |

Note. TS = Technostress; Techno-Overload = TSOVR; Techno-Invasion = TSINV; TSUNC = Techno-Uncertainty; TSCOM = Techno-Complexity; TSINS = Techno-Insecurity; TRF = Transformational Leadership; TRN = Transactional Leadership; PA = Passive Avoidant Leadership; JS = Job Satisfaction